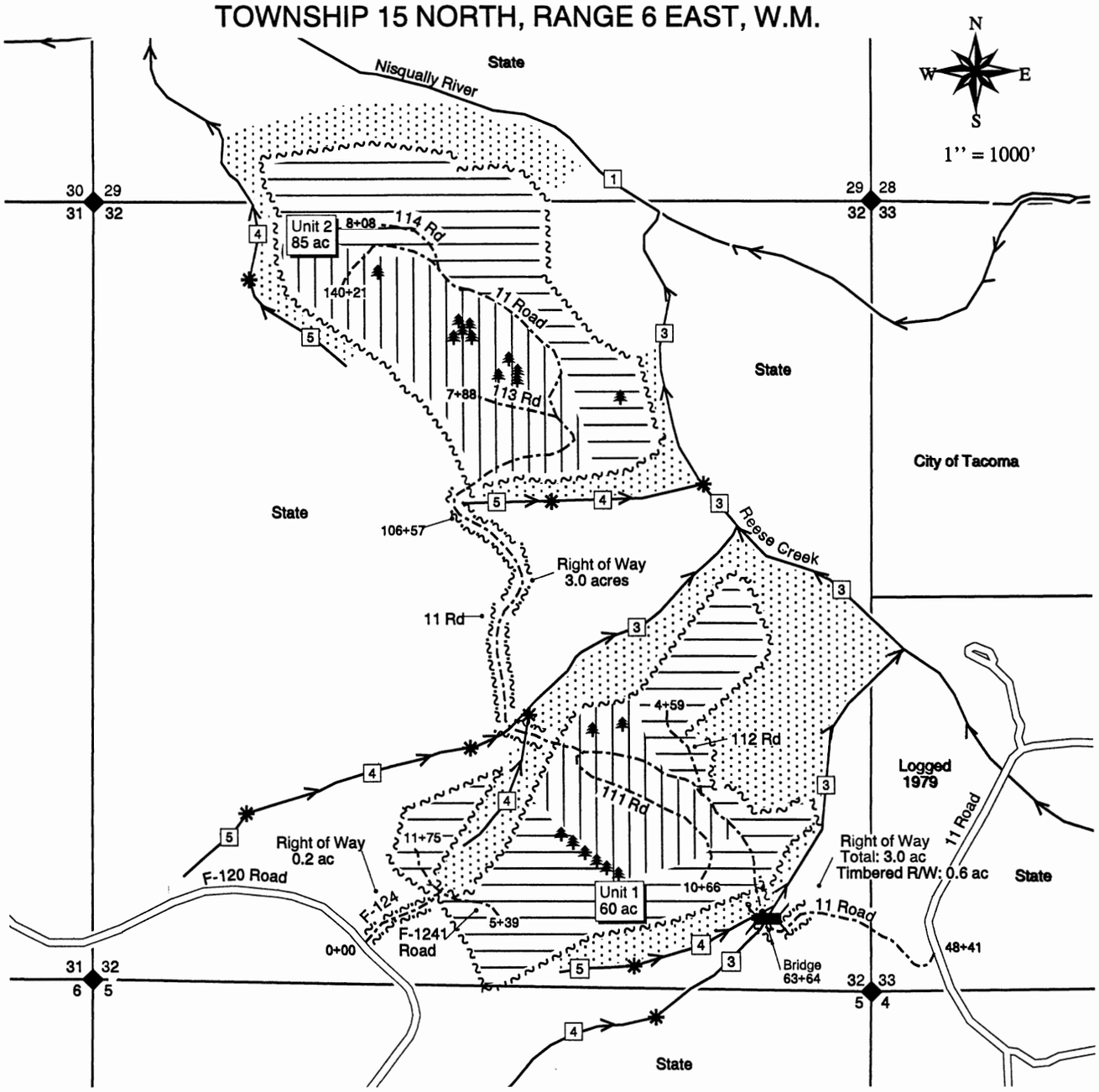
TIMBER SALE MAP

SALE NAME: THE BIG KAHUNA
AGREEMENT NO: 30-076006
TRUST(S): FOREST BOARD TRANSFER, CAPITOL
REGION: SOUTH PUGET SOUND
COUNTY(S): LEWIS

ROAD PLAN PROJECT MAP
TOWNSHIP 15 NORTH, RANGE 6 EAST, W.M.



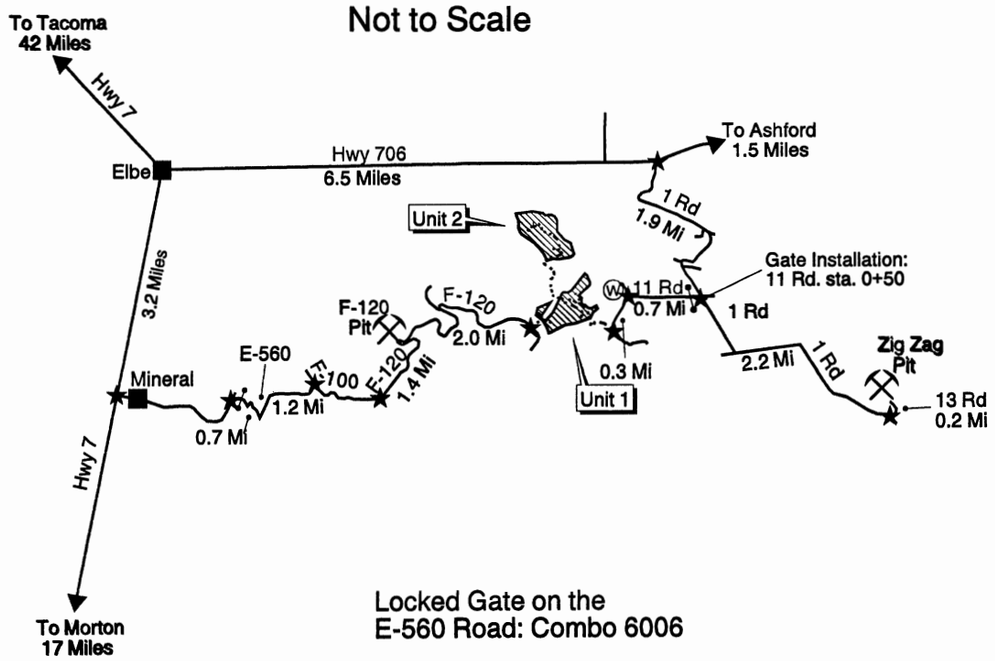
ELEVATION RANGE: 2,000 - 2,500 feet

LEGEND

- White Timber Sale Boundary Tags
- Orange Right of Way Boundary Tags
- Cable
- Ground based
- RMZ
- Existing Road
- Optional Construction
- Water Type Break
- Bridge
- Leave tree clumps marked with yellow leave tree area tags
- 3 — Water Type
- Survey Corner
- Ⓦ — Waste Area

Drawn By: Alicia Sullivan
Date: July 28, 2004

VICINITY MAP
Not to Scale



Locked Gate on the
E-560 Road: Combo 6006

STATE OF WASHINGTON
DEPARTMENT OF NATURAL RESOURCES
SOUTH PUGET SOUND REGION

THE BIG KAHUNA

ROAD PLAN

SECTIONS 29, 32 & 33, TOWNSHIP 15 NORTH, RANGE 06 EAST, W.M.
LEWIS COUNTY

RAINIER DISTRICT

AGREEMENT NO.: 30-076006 STAFF ENGINEER: M. Bell

DATE: 07/28/2004 DRAWN & COMPILED BY: M. Bell

SECTION 0 - SCOPE OF PROJECT

This project includes but is not limited to construction and optional construction including:

clearing;
grubbing;
right-of-way debris disposal;
excavation and/or embankment to subgrade;
landing construction;
acquisition and installation of drainage structures;
acquisition, manufacture, and application of rock;
bridge acquisition and installation;
grass seeding;
road abandonment.

This project also includes but is not limited to pre-haul maintenance including:

brushing right-of-way;
cleaning ditches;
grading and shaping existing road surface and turnouts;
spot rocking;
gate installation.

SECTION 1 - GENERAL CLAUSES

1.1-1 **ROAD PLAN SCOPE**

Clauses in this plan apply to all construction or pre-haul maintenance including landings unless otherwise noted.

1.1-2 **REQUIRED ROADS**

Construction or pre-haul maintenance of the following roads is required. All roads shall be constructed or pre-haul maintained on the State's location and in accordance with this Road Plan.

Road	Stations	Type
11	0+00 to 48+41	Pre-haul maintenance
11	48+41 to 106+57	Construction
F-124	0+00 to 6+00	Construction

1.1-3 **OPTIONAL ROADS**

Construction of the following roads is not required. Roads used by the Purchaser shall be constructed on the State's location and in accordance with this Road Plan.

Road	Stations	Type
11	106+57 to 140+21	Construction
111	0+00 to 10+66	Construction
112	0+00 to 4+59	Construction
113	0+00 to 7+88	Construction
114	0+00 to 8+08	Construction
F-124	6+00 to 11+75	Construction
F-1241	0+00 to 5+39	Construction

1.1-4 **ROAD PLAN CHANGES**

Any departure from this Road Plan including relocation, extension, change in design or additional roads shall be submitted in writing, to the Contract Administrator for consideration, submitted plans must be approved before construction begins.

1.1-5 **HIDDEN CONDITIONS**

On this plan quantities are minimum acceptable values. Additional quantities required by the State because of hidden conditions or Purchaser's choice of construction season or techniques shall be at the Purchaser's expense. Hidden conditions include, but are not limited to: solid subsurface rock, subsurface springs, saturated ground, and unstable soil.

1.2-1 **CONSTRUCTION PERIOD**

The construction, pre-haul maintenance, or rock haul on any of the roads specified herein shall not be permitted when in the opinion of the Contract Administrator, excessive damage may occur, nor shall it be permitted from November 1 to May 31 unless authority to do so is granted, in writing, by the Contract Administrator.

1.2-1C **DAILY CONSTRUCTION TIME**

No operation of road construction equipment will be allowed on weekends or State recognized holidays unless authority to do so is granted in writing by the Contract Administrator.

1.2-2 **HAUL APPROVAL**

Purchaser shall not use roads constructed or pre-haul maintained under this Road Plan for hauling, other than timber cut on the right-of-way, without written approval from the Contract Administrator.

1.2-3 **EXCAVATOR CONSTRUCTION**

Roads shall be constructed using track mounted hydraulic excavators unless otherwise authorized, in writing, by the Contract Administrator.

1.2.1-1 **CONSTRUCTION STEPS**

Pioneering shall not extend past construction that will be completed during the current construction season. Pioneering shall not extend more than 1000 feet beyond completed construction unless approved, in writing, by the Contract Administrator. Drainage shall be provided on all uncompleted construction as approved, in writing, by the Contract Administrator. Road pioneering operations shall not undercut the final cut slope, deposit excavated material outside the grubbing limits, or restrict drainage.

Clearing and grubbing shall be completed prior to starting excavation and embankment.

Culvert placement in live streams shall precede embankment where culverts are to be placed along natural ground.

Culverts shall be installed in completed subgrade as construction progresses.

Subgrade, ditches, culvert installations, and subgrade compaction shall be completed and are subject to written approval by the Contract Administrator prior to rock application, and/or timber haul.

1.3-1A **CLOSURE TO PREVENT ROAD DAMAGE**

At any time of the year, the hauling of forest products shall not be permitted when in the opinion of the Contract Administrator excessive road damage may occur.

1.4-2 **SLOPE STAKING**

The following road shall be constructed in accordance with construction stakes.

Road	Stations
11	51+76 to 53+90
11	60+30 to 74+46
11	103+58 to 107+17

1.4-3 **R P DAMAGE**

Reference points (R.P.'s), including slope stake R.P.'s, that are moved or damaged at any time during construction shall be reset in their original locations by the Purchaser. Excavation and embankment shall not proceed on road segments controlled by said R.P.'s until all moved or damaged R.P.'s are reset.

1.5-1 **ROAD MAINTENANCE RESPONSIBILITY**

Maintenance on roads listed in Contract Clauses C-50 (Purchaser Road Maintenance and Repair) and C-60 (Designated Road Maintainer) shall be performed in accordance with Forest Access Road Maintenance Specifications.

SECTION 2 - CLEARING

2.1-1 **CLEARING SPECIFICATION**

Fell all vegetative material larger than 6 inches DBH or over 20 feet high between the marked right-of-way boundaries or if not marked in the field, between clearing limits specified on TYPICAL SECTION SHEET.

SECTION 3 - GRUBBING

3-1 **GRUBBING SPECIFICATIONS**

All stumps shall be removed that fall between grubbing limits shown on the TYPICAL SECTION SHEET. Those outside the grubbing limits but with undercut roots shall also be removed.

3-2 **GRUBBING LIMITS**

Grubbing limits are defined as the entire area between the external limits shown on the TYPICAL SECTION SHEET.

3-3 **WASTE AREA STUMP REMOVAL**

Within waste area, removal of stumps shall not be required, provided that they are cut flush with the ground.

Road	Stations
11	34+35 (old spur right)

SECTION 4 - DEBRIS DISPOSAL AND REMOVAL

4.1-1 **DEBRIS DEFINITION**

Right-of-way debris is defined as all non-merchantable vegetative material larger than one cubic foot in volume within the clearing limits.

4.1-2 **DISPOSAL COMPLETION**

All right-of-way debris disposal shall be completed prior to the application of rock and/or timber haul.

4.2.3-3 **DEBRIS PLACEMENT**

Right-of-way debris shall not be placed against standing timber.

4.2.3-4 **SCATTERING RIGHT OF WAY DEBRIS**

Right-of-way debris shall be scattered outside the right-of-way clearing limits in natural openings.

4.3-1 **BRUSHING**

On the following road, vegetative material including limbs up to 3 inches in diameter shall be cut and removed to 2 feet beyond the back of the ditch and 2 feet beyond the outer edge of the subgrade and to a height of 14 feet above the road surface. Vegetative material shall be cut as near flush with the ground as possible, but shall not extend more than 3 inches above the ground.

Road	Stations
11	30+00 to 48+41

SECTION 5 - EXCAVATION

5.1-1 **DEFAULT ROAD DIMENSIONS**

Unless controlled by specific design sheets herein, roads shall be constructed in accordance with dimensions shown on the TYPICAL SECTION SHEET.

5.1-3 **ROAD GRADE AND ALIGNMENT**

Road grade and alignment shall conform to the State's marked location. Grade and alignment shall have smooth continuity without abrupt changes in direction. Maximum grades are: 18 percent favorable and 12 percent adverse or as specified on drawings. Minimum radius curve is 60 feet.

5.1-4 **CURVE WIDENING**

Minimum extra widening on the inside of curves shall be:

5 feet extra	80 to 100 foot radius curve
7 feet extra	60 to 80 foot radius curve

Curve widening, where required, shall be added to the inside of curves.

5.1-16 **REQUIRED END HAUL LOCATIONS**

On the following road, excess excavated material shall be end hauled to designated waste area as directed by the Contract Administrator.

End Haul/Waste Material Disposal

Road	Station	Waste Area Location	Remarks
11	60+30 to 70+00	34+35	spur road to right

5.1-7 **CONSTRUCTION TOLERANCES**

Roads shall be constructed to the dimensions shown on the TYPICAL SECTION SHEET, within the tolerance listed below. Tolerance classes for each road are listed on the TYPICAL SECTION SHEET.

Tolerance Class	A	B	C
Road Width (feet)	+1.5	+1.5	+2.0
Subgrade elevation (feet +/-)	0.5	1.0	2.0
Centerline alignment (feet lt./rt.)	1.0	1.5	3.0

5.1-8 **CUT SLOPE RATIO**

Excavation (cut) slopes shall be constructed no steeper than shown on the following table:

Material Type	Excavation Slope Ratio	Percent
Common Earth (on side slopes less than 55%)	1:1	100
Common Earth (55% to 70% sideslopes)	¾:1	133
Common Earth (on slopes over 70%)	½:1	200
Fractured or loose rock	½:1	200
Hardpan or solid rock	¼:1	400

5.1-9 **SHAPING CUT SLOPE**

Excavation and embankment slopes shall be constructed to a uniform line and left rough for easier revegetation.

5.1-10 **FILL WIDENING**

Embankments shall be widened as follows:

Height at Shoulder	Subgrade Widening
Less than 6 feet	2 feet
6 feet or over	4 feet

5.1-11 **FILL SLOPE RATIO**

Embankment (fill) slopes shall be constructed no steeper than shown on the following table:

Material Type	Embankment Slope Ratio	Percent
Common Earth and Rounded Gravel	1½:1	67
Angular Rock	1¼:1	80
Sandy Soils.	2:1	50

5.1-12 **DISPOSAL OF ORGANIC DEBRIS**

Organic material shall be excluded from embankment as shown on the TYPICAL SECTION SHEET.

5.1-14 **FULL BENCH CONSTRUCTION**

Where side slopes exceed 45 percent, full bench construction shall be utilized for the entire subgrade width or as designed.

5.1-15 **END HAUL CONSTRUCTION**

Waste material may be deposited adjacent to the road prism on side slopes up to 55 percent if the waste material is compacted. On side slopes of 55 percent or more, all excavation shall be end hauled or pushed to designated embankment sites. All waste embankments shall be compacted in horizontal layers not exceeding 2 feet.

5.1-22 **PROHIBITED DISPOSAL AREAS**

Waste material shall not be deposited within 100 feet of a culvert installation, live stream, Riparian Management Zone, wetland or Wetland Management Zone.

5.1-23 **TURNOUTS**

Turnout locations noted on this plan are approximate. Locations shall be adjusted to fit with final subgrade alignment and sight distances.

5.3-1 **FILL COMPACTION**

All embankment and waste material shall be compacted. The minimum acceptable compaction is achieved by placing embankments in 2 foot or shallower lifts and routing excavation equipment over entire width of the lifts. Side hill embankments too narrow to accommodate excavation equipment may be placed by end-dumping or side casting until sufficiently wide to support the equipment.

5.3-2 **VIBRATORY FILL COMPACTION**

On the following road, all embankment and select borrow deeper than 5 feet at the road shoulder shall be compacted full width in 1 foot lifts by four coverages with a vibratory drum roller weighing at least 20,000 pounds at a maximum operating speed of 3 mph.

Road	Stations
11	48+41 to 106+57

5.4-3 **SEEDING AND FERTILIZING CONSTRUCTION SLOPES**

On the following road, Purchaser shall seed and fertilize cut and fill slopes. Application rate shall be 50 pounds seed per acre and 200 pounds fertilizer per acre. Seed and fertilizer will be provided by the Purchaser. Date of application will be subject to written approval by the Contract Administrator.

Road	Seed Specification	Fertilizer Specification	Stations
11	40% Perennial Ryegrass 40% Creeping Red Fescue 10% White Clover 10% Annual Ryegrass	16-16-16	48+41 to 140+21

5.5-4 **SUBGRADE COMPACTION**

Constructed subgrades shall be compacted full width except ditch prior to rock application. Compaction shall be by a smooth-drum vibratory roller weighing at least 20,000 pounds. Four complete passes shall be made at a maximum operating speed of 3 mph.

Road	Stations
11	48+41 to 140+21

5.5-5 **SUBGRADE CROWN**

Finished subgrade shall be crowned as shown on the TYPICAL SECTION SHEET, and shall be uniform, firm, rut-free, and shaped to ensure surface runoff in an even, unconcentrated manner.

SECTION 6 - DRAINAGE

6.2.1-1 **CULVERT MATERIAL SPECIFICATION**

On required roads Purchaser shall furnish, install, and maintain galvanized culverts (AASHTO specification No. M-36 or on culverts 24 inches or less corrugated polyethylene pipe (AASHTO specification No. M-294-S) may be used as designated on the CULVERT LIST. Culvert and flume lengths shall be varied to fit as-built conditions subject to written approval by the Contract Administrator.

6.2.1-1A **TEMPORARY CULVERTS**

On optional roads, Purchaser shall furnish, install and maintain temporary culverts of the length and diameter specified on the CULVERT LIST. Culverts may be new or used steel, plastic, concrete, or such other material as approved by the Contract Administrator. All said culverts shall be removed from the road bed and State Land as indicated in clause 10.1-1.

6.2.1-2 **CULVERT BANDS**

Annular corrugated bands and culvert ends shall be used on metal culverts. On culverts 24 inches and smaller, bands shall have a minimum width of 12 inches, on culverts over 24 inches, bands shall have a minimum width of 24 inches. Manufacturer's approved connectors shall be used for corrugated polyethylene pipe.

6.2.1-5 **REQUIRED CULVERTS STATE PROPERTY**

On required roads: culverts, downspouts, flumes, bands, and gaskets as listed on the CULVERT LIST, which are not installed, shall become property of the State.

6.2.2.1-1 **CULVERT SPECIFICATIONS**

Culvert, downspout, flume, and energy dissipator installation shall be in accordance with CULVERT AND DRAINAGE SPECIFICATION DETAIL and the National Corrugated Metal Pipe Association "Installation Manual for Corrugated Steel Drainage Structures".

6.2.2.2-1 **CULVERT DAMAGE REPAIR**

Any damaged galvanized coating or cut ends shall be retreated with a minimum of 2 coats of zinc rich paint.

6.2.2.3-1 **CROSS DRAIN SKEW**

Cross drains and surface culverts on road grades in excess of 3% shall be skewed at least 30 degrees from perpendicular to the road centerline, except for cross drain culverts at the low points of dips in roads shall not be skewed.

6.2.2.3-2 **CULVERT SLOPE**

Cross drain culverts shall be installed at a slope steeper than the incoming ditch grade, but not less than 3% nor more than 10%.

6.2.2.4-1 **CULVERTS REQUIRING WRITTEN APPROVAL**

Installations of culverts 30 inches in diameter and over shall be subject to written approval by the Contract Administrator prior to making backfill.

6.2.2.5-1 **ENERGY DISSIPATORS**

Drainage structure outfalls shall not terminate directly on unprotected soil that will erode. Downspouts, flumes, and energy dissipators shall be installed to prevent erosion.

6.3-1 **DITCH CONSTRUCTION**

Ditches shall be constructed concurrently with construction of the subgrade. Ditches shall drain to culverts, ditchouts, and natural drainages.

6.3-2 **DITCH, HEADWALL, AND CATCHBASIN CONSTRUCTION**

Shaping the ditchline, culvert headwalls, and catch basins shall be completed prior to application of rock and/or timber haul and shall be done in accordance with the TYPICAL SECTION SHEET and CULVERT AND DRAINAGE SPECIFICATION DETAIL.

6.4-1 **CATCH BASINS**

Catch basins shall be constructed to resist erosion in accordance with CULVERT AND DRAINAGE SPECIFICATION DETAIL. Minimum dimensions: two feet wide and four feet long with backslopes consistent with Clause 5.1-8: Excavation Slopes.

6.5-1 **HEADWALLS**

Headwalls shall be constructed in accordance with CULVERT AND DRAINAGE SPECIFICATION DETAIL at all cross drain culverts.

6.5-2 **CULVERT ARMORING**

Embankment slopes adjacent to culverts at live stream crossings shall be armored with machine placed rip rap for a distance of one culvert diameter on each side of the pipe and one culvert diameter above the pipe in accordance with the CULVERT LIST.

SECTION 7 - ROCK

7.1-1 **ROCK SOURCES**

Rock for construction and/or pre-haul maintenance under this contract may be obtained from sources on State land as listed below at no charge to the Purchaser. Development and use shall be in accordance with a written "Development Plan" prepared by the State. Upon completion of operations, the rock source shall be left in the condition specified in said plan, subject to approval by the Contract Administrator. Use of material from any other source must have prior written approval from the Contract Administrator. If other operators are using or desire to use these rock sources, joint-operating plans shall be developed. All parties shall follow these plans.

Source	Location	Type
Zig Zag	SE ¼ SW ¼ Section 2 Township 14 North Range 6 East	4 Inch In-Place
F-120	NW ¼ Section 6 Township 14 North Range 6 East	4 Inch In-Place

7.1-1C **COMMERCIAL SOURCE**

Rock for construction under this contract may be obtained from any commercial source as approved in writing by the Contract Administrator.

Type
2 ½ Inch Minus Crushed

7.1-4 **APPROVED ROCK SOURCES**

All non-commercial pit operations shall be conducted as directed by the Contract Administrator.

7.2.1-4 **ROCK QUALITY**

"2½ INCH MINUS CRUSHED" and "QUARRY SPALLS" rock shall meet the following specifications for gradation and quality. The exact point of evaluation for conformance to specifications will be determined by the Contract Administrator:

7.2.1.1-5
2½ INCH MINUS CRUSHED ROCK

% passing 2½" square sieve	100%
% passing 2" square sieve	65 -100%
% passing 1" square sieve	50 - 70%
% passing ¼" square sieve	30 - 50%
% passing U.S. #40 sieve	16% Max
% passing U.S. #200 sieve	5% Max

All percentages are by weight.
The portion of ballast retained on ¼ inch sieve shall not contain more than 0.1 percent vegetative debris or trash.

7.2.1.1-7C
QUARRY SPALLS

% passing 8" square sieve	100%
% passing 3" square sieve	40% Max.
% passing ¾" square sieve	10% Max.

All percentages are by weight.
The portion of ballast retained on ¼ inch sieve shall not contain more than 0.1 percent vegetative debris or trash.

7.2.1.1-8 **4 INCH IN PLACE**
"4 INCH IN PLACE" rock shall have a minimum of 90 percent of the top 4 inches of the running surface pass a 4-inch square opening. Processing such as grid rolling, jaw crushing, or such other method as is demonstrated by the Purchaser to be effective, shall be required if necessary to achieve this requirement.

7.2.1.2-2 **DEBRIS IN ROCK**
Manufactured run rock shall contain no more than 5 percent by weight of vegetative debris, dirt, or trash.

7.2.4-1 **DRILLING AND SHOOTING SPECIFICATION**
Rock drilling and shooting shall meet the following specifications:

a. Oversize material remaining in the rock source at the conclusion of the timber sale shall not exceed 5 percent of the total volume mined for the sale.

b. Oversize material is defined as rock fragments larger than 1.5 feet in any dimension.

c. The Purchaser shall submit an informational drilling and shooting plan to the Contract Administrator 5 working days prior to any drilling.

7.4.2-1 **MINIMUM ROCK**
Apply at least the minimum required rock quantity as shown on ROCK LIST. Required and optional rock shall meet the specifications on the ROCK LIST.

7.4.2-2 **SUBGRADE APPROVAL FOR ROCK**
Subgrade shall be approved, in writing, by the Contract Administrator prior to application of rock.

7.4.2-3 **SUBGRADE SHAPING**
On the following road, a grader shall be used to shape the subgrade prior to the application of rock.

Road	Stations
11	48+41 to 140+21

7.4.2-3A **SHAPING EXISTING SURFACE**

On the following road, a grader shall be used to shape the existing surface prior to the application of rock.

Road	Stations
11	0+00 to 48+41

7.4.2-7 **ROCK FOR WIDENING**

Turnouts and curve widening shall have rock applied to the same depth and specifications as the traveled way.

7.4.2-8 **ROCK SHAPING**

Each lift of rock shall be crowned as shown on TYPICAL SECTION SHEET, and shall be uniform, firm, rut-free, and shaped to ensure surface runoff in an even, unconcentrated manner.

7.4.3-2 **ROCK COMPACTION**

On the following road, rock shall be spread and compacted full width in lifts each not to exceed 12 inches uncompacted depth. Compaction shall be by smooth drum vibratory roller weighing at least 20,000 pounds. Four complete passes at a maximum speed of 3 mph shall be made on each lift.

Road	Stations
11	48+41 to 140+21

7.4.3-3 **COMPACTION TIMING**

On all roads, rock shall be spread and compacted concurrently with rock hauling operations.

7.4.4-1 **RIP RAP SPECIFICATION**

Riprap shall consist of angular stone, placed on slopes as indicated in this plan or as directed by the Contract Administrator.

Loose Riprap - The stone for loose riprap shall be hard, sound and durable. It shall be free from segregation, seams, cracks, and other defects tending to destroy its resistance to weather. Loose riprap shall be free of rock fines, soil, or other extraneous material.

a. Heavy Loose Riprap - Shall meet the following requirements for grading:

At Least/Not More Than	Minimum Size	Maximum Size
40% / 90%	1 Ton (1/2 cu. yd.)	--
70% / 90%	300 lbs. (2 cu. ft.)	--
10% / 30%	--	50 lbs.

b. Light Loose Riprap - Shall meet the following requirements for grading:

At Least/Not More Than	Size Range	Maximum Size
20% / 90%	300 lbs. to 1 ton	--
80% / --	50 lbs. to 1 ton	--
10% / 20%	--	50 lbs.

7.4.4-2 **RIP RAP PLACEMENT**

Riprap shall be set in place in conjunction with or immediately following construction of the embankment. Placement shall be by zero drop height methods only.

8.3-2 BRIDGE SPECIFICATION

The bridge listed below shall be portable and constructed of steel or steel and concrete. The bridge shall be designed by a professional structural engineer licensed in the State of Washington. The footings and foundation shall be designed by a professional engineer licensed in the State of Washington. If requested by the Contract Administrator, the Purchaser shall provide a licensed engineer who shall perform on-site inspections at each construction stage as outlined below to ensure materials and procedures used during construction comply with the design and shall notify the Contract Administrator in writing that all elements of each of the following construction stages are in conformance with the design before allowing construction to continue on to the next stage.

a. Abutment bearings, forms, iron work, and concrete, if any.
b. Cap forms, iron work, concrete, and/or placement, if any.
c. Superstructure forms, iron work, concrete, or placement, if any.
d. Bridge placement and assembly.
e. Bank protection.

Road	Station	Min. Length	Loading	W.B.W.G.*	Vert.Clear**	Hor. Align
11	63+64 to 64+24	60'	HS-30	14'	P.P.	P.P.

*W.B.W.G. = Width between wheel guards
**Vertical clearance shall be measured from 100-year flood level.
P.P. = On the attached plan/profile

Bank protection shall be designed and constructed to prevent undermining of the bridge or erosion of the bridge approach embankments. Guardrails designed to withstand the impact of a loaded vehicle shall be installed with a minimum height of 21 inches. The bridge running surface shall have a minimum of one percent grade with a smooth transition between the approach and running surface.

The bridge shall meet the following specifications:

Deflections due to dead load, service live load and controlled live load with impacts shall not exceed L/500 of the span.

Running surface shall be full width running planks of treated #2 Douglas Fir 4" x 12" or concrete;
W-beam guardrails and terminal ends in compliance with Washington State Department of Transportation Standard Plans 1998;
Paint in accordance with Clause 8.3-3;
Galvanized sheet piling or concrete backwall as per Clause 8.3-7.

8.3-2A BRIDGE INSTALLATION

Each stage of construction, as listed below, shall be approved in writing by the Contract Administrator or their designee, prior to commencement on the following stage:

1. Abutment placement
2. Bridge placement and assembly
3. Road approach grade and subgrade compaction.
4. Rock application.
5. Bank protection.

8.3-2B BRIDGE DRAWINGS AND CALCULATIONS

Purchaser shall submit the reports and plans listed below to the Region Engineer at the South Puget Sound Region office at 950 Farman Ave. N., Enumclaw, WA 98022. All drawings and calculations shall be prepared, stamped, and signed by a registered professional engineer licensed in the State of Washington. Purchaser shall not proceed with construction until the Region Engineer has issued written approval. Reports and plans will be approved or rejected within 10 working days of receipt. Within 15 working days of final approval, Purchaser shall submit three complete sets of final plans.

Layout and Design Drawings
Load Bearing Calculations
Final Plans

8.3-3 **PAINT DETAILS**

All exposed steel used in this structure shall be painted if not otherwise specified as being galvanized. All paint products used on this project shall be manufactured by the same manufacturer and shall be compatible with one another. Paints supplied for this project shall conform to the following minimum requirements:

1. Primer

Generic Type: Zinc filled, single component, moisture-cured polyurethane

Vehicle Type:	Moisture-cured polyurethane
Volume Solids:	60% minimum
Pigment Type:	Zinc Dust
Coverage:	3 Mils DFT minimum
VOC:	Not to exceed 2.8 lbs/gal

2. Intermediate Coat

Generic Type: Refined coal tar/Micaceous Iron Oxide-filled, single component, moisture-cured polyurethane

Vehicle Type:	Moisture-cured polyurethane
Volume Solids:	60% minimum
Pigment Type:	4.0 lbs/gal of Micaceous Iron Oxide minimum
Color:	Black
Coverage:	4 mils DFT minimum
VOC:	Not to exceed 2.8 lbs/gal

3. Shield (Top) Coat

Generic Type: Refined coal tar/Micaceous Iron Oxide-filled, single component, moisture-cured polyurethane

Vehicle Type:	Moisture-cured polyurethane
Volume Solids:	60% minimum
Pigment Type:	3.0 lbs/gal of Micaceous Iron Oxide minimum
Color:	Bronze
Coverage:	4 mils DFT minimum
VOC:	Not to exceed 2.8 lbs/gal

A pre-approved system confirming to the above specifications is manufactured by:

Wasser High-Tech Coatings Inc.
1004 W. James St STE 100
Kent, WA 98032
(253) 850-2967

8.3-4 **LIFT DEVICE**

Lift devices shall be provided for each section.

8.3-5 **MATERIAL SPECS**

Flanges used for connecting the stringer units together shall be designed to facilitate field assembly. All bolts used to facilitate field assembly will be galvanized. All materials necessary for assembly shall be included with the structure and meet the following requirements:

1. Workmanship, fabrication and shop connections will be in accordance with current edition of the American Association of State Highway and Transportation Officials Standard Specifications (AASHTO) for highway Bridges. Design details not covered by the AASHTO specifications shall be in accordance with other normally accepted structural design standards.

2. All galvanizing shall be done after fabrication and shall be in accordance with AASHTO Designation M111-80 (ASTM Designation: A123-78) and/or AASHTO Designation M232-84 (ASTM Designation A153-82).

3. All hardware connections and fasteners shall be in accordance with AASHTO Designation M164 (ASTM Designation A325).

4. All timber used shall be pressure treated Douglas-Fir in accordance with AASHTO Designation M168-84. All materials shall be No. 2 and better in grade. All of the pressure treated timber shall be incised and treated by a empty cell process in accordance with AASHTO M133-86 and AWPA Standard P8-91. Preservatives utilized will be hydrocarbon solvent, Type A, to a minimum net retention of .50 lb/cu.ft. In accordance with AWPA Standard C28-91.

5. Elastomeric bearing pads shall conform to the requirements of AASHTO M251.

6. All concrete used shall conform to AASHTO specifications.

8.3-6 **BRIDGE DECK**

Bridge deck shall be 7-gauge galvanized corrugated steel or modular concrete panels. Steel shall be placed perpendicular to the direction of traffic and sized and spaced for design loading. The deck shall have a positive connection joining the deck panels to the modular bridge sections. Running surface shall be full width running planks of treated #2 Douglas Fir 4" x 12" or concrete.

8.3-7 **BACK WALLS**

Back walls shall be furnished for each end of the bridge to support the roadway at the end of the bridge. Back wall shall be galvanized steel with a minimum thickness of 7-gauge or concrete. Back walls shall extend from the top of the bridge footing to the top of the bridge stringers.

8.4-7 **STEEL GATE**

On the following road, Purchaser shall furnish and install a 16 foot wide steel gate mounted on steel posts in accordance with the STEEL GATE DETAIL prior to road construction. Each post shall be set in a minimum of 2 cubic yards of poured-in-place concrete. The gate shall be installed with a post and locking device to allow gate to be locked in an open position, as approved by the Contract Administrator. If the Purchaser wishes to install an alternate design, detailed plans for the construction of the gate shall be submitted to the Contract Administrator and District Engineer and approved, in writing, prior to gate installation.

Road	Stations
11	0+50

8.4-8 **GATE CLOSURE**

On the following road, gates shall be closed and locked when no operation is in progress.

Road	Stations
11	0+50

SECTION 9 - ROAD AND LANDING DEACTIVATION

9.2-1 **LANDING DEBRIS**

Purchaser shall reduce or relocate debris generated by road and landing construction, in a manner approved, in writing, by the Contract Administrator, to avoid landing failures and potential debris slides.

9.2-2 **LANDING DRAINAGE**

Purchaser shall provide for drainage of the landing surface as approved by the Contract Administrator.

SECTION 10 - ROAD AND LANDING ABANDONMENT

10.1-1 **ABANDONMENT**

If constructed, the following roads shall be abandoned by the Purchaser within 30 days following completion of timber removal.

Road	Stations
11	106+57 to 140+21
111	0+00 to 10+66
112	0+00 to 4+59
113	0+00 to 7+88
114	0+00 to 8+08
F-124	6+00 to 11+75
F-1241	0+00 to 5+39

10.1-1A **ABANDONMENT**

Abandonment shall consist of:

Constructing non-drivable water bars in conformance with the attached NON-DRIVABLE WATER BAR DETAIL at a maximum spacing which will produce a vertical drop of no more than 10 feet between water bars or between natural drainage paths and with a maximum spacing of 100 feet;

Skewing water bars at least 30 degrees from perpendicular to the road centerline on roads in excess of 3% grade;

Keying water bars into ditchline;

Removing ditch cross drain culverts and leaving the resulting trench open;

Sloping all trench walls and approach embankments no steeper than 1.5:1;

Removing culverts from State Land;

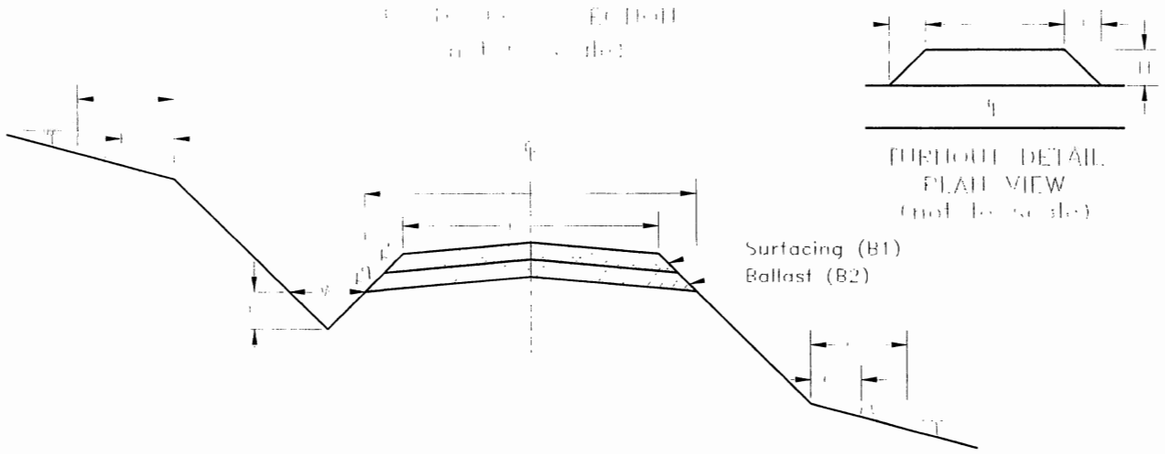
Grass seeding concurrently with abandonment and in accordance with Clause: 5.4-3;

Covering, concurrently with abandonment, all exposed soils within 100 feet of any typed water, with a 3 inch deep layer of straw;

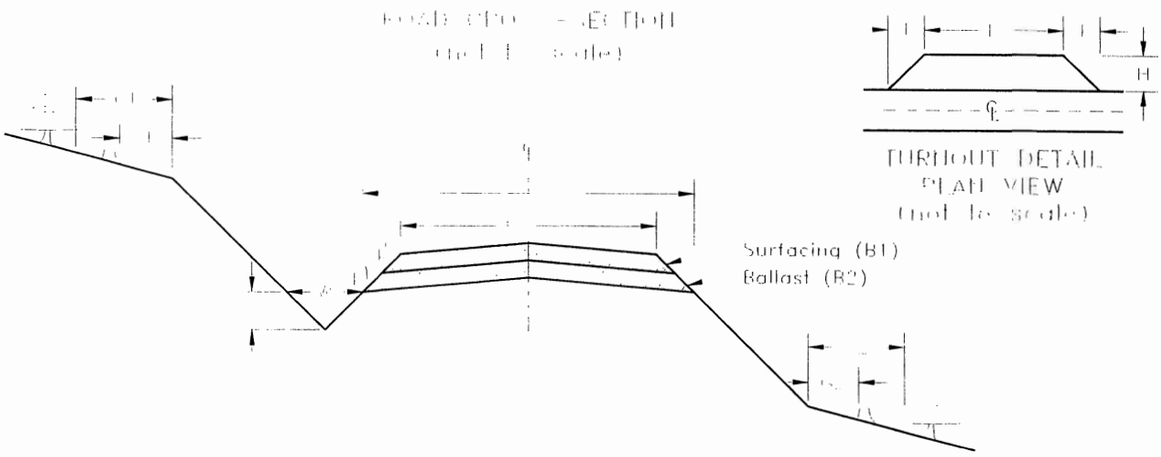
Scattering right of way debris over the road prism;

All work shall be completed as directed by the Contract Administrator.

TYPICAL SECTION SHEET



Road Number	From Station	To Station	Tolerance Class	Subgrade Width (feet)	Road Width (feet)	Ditch Width (feet)	Ditch Depth (feet)	Crown in. @ CL	Grubbing Limits (feet)		Clearing Limits (feet)		Cut Slope Ratio	Fill Slope Ratio
				S	R	W	D		G1	G2	C1	C2	%	%
11	0+00	53+16	B	16	12	2	1	4	2	2	5	5	100	67
11	53+16	66+30	B	16	12	2	1	4	2	2	tags	tags	100	67
11	66+30	86+43	B	16	12	2	1	4	2	2	5	5	100	67
11	86+43	106+57	B	16	12	2	1	4	2	2	tags	tags	100	67
11	106+57	108+57	C	14	10	2	1	4	0	0	tags	tags	100	67
11	108+57	140+21	C	14	10	2	1	4	0	0	0	0	100	67
111	0+00	10+66	C	14	10	2	1	4	0	0	0	0	100	67
112	0+00	4+59	C	14	10	2	1	4	0	0	0	0	100	67
113	0+00	7+88	C	14	10	2	1	4	0	0	0	0	100	67
114	0+00	8+08	C	14	10	2	1	4	0	0	0	0	100	67
F-124	0+00	6+00	C	14	10	2	1	4	0	0	0	0	100	67
F-124	6+00	11+75	C	14	10	2	1	4	0	0	tags	tags	100	67
F-1241	0+00	5+39	C	14	10	2	1	4	0	0	0	0	100	67



ROCK LIST

BALLAST

Road Number	From Station	To Station	Rock Slope	Compacted Rock Depth	C.Y./ Station	# of Stations	C.Y. Subtotal	Rock Source	Turnout Length	Turnout Width	Turnout Taper
			K2	B2	4-Inch In Place				L	H	T
11	48+41	61+29	2:1	12"	52	13	676	Zig Zag Pit	50	12	25
11	61+29	63+64	2:1	6"	28	2	56	Zig Zag Pit	50	12	25
11	63+64	64+24	2:1	12"	52	0.6	31	Zig Zag Pit	50	12	25
11	64+24	66+12	2:1	6"	28	2	56	Zig Zag Pit	50	12	25
11	66+12	106+57	2:1	12"	52	40	2080	Zig Zag Pit	50	12	25
11*	106+57	140+21	2:1	12"	44	34	1496	Zig Zag Pit	50	12	25
111*	0+00	10+66	2:1	12"	44	11	484	Zig Zag Pit			
112*	0+00	4+59	2:1	12"	44	5	220	Zig Zag Pit			
113*	0+00	7+88	2:1	12"	44	8	352	Zig Zag Pit			
114*	0+00	8+08	2:1	12"	44	8	352	Zig Zag Pit			
F-124	0+00	6+00	2:1	12"	44	6	264	F-120 Pit			
F-124*	6+00	11+75	2:1	12"	44	6	264	F-120 Pit			
F-1241*	0+00	5+39	2:1	12"	44	5	220	F-120 Pit			

BALLAST TOTAL 6551 Cubic Yards

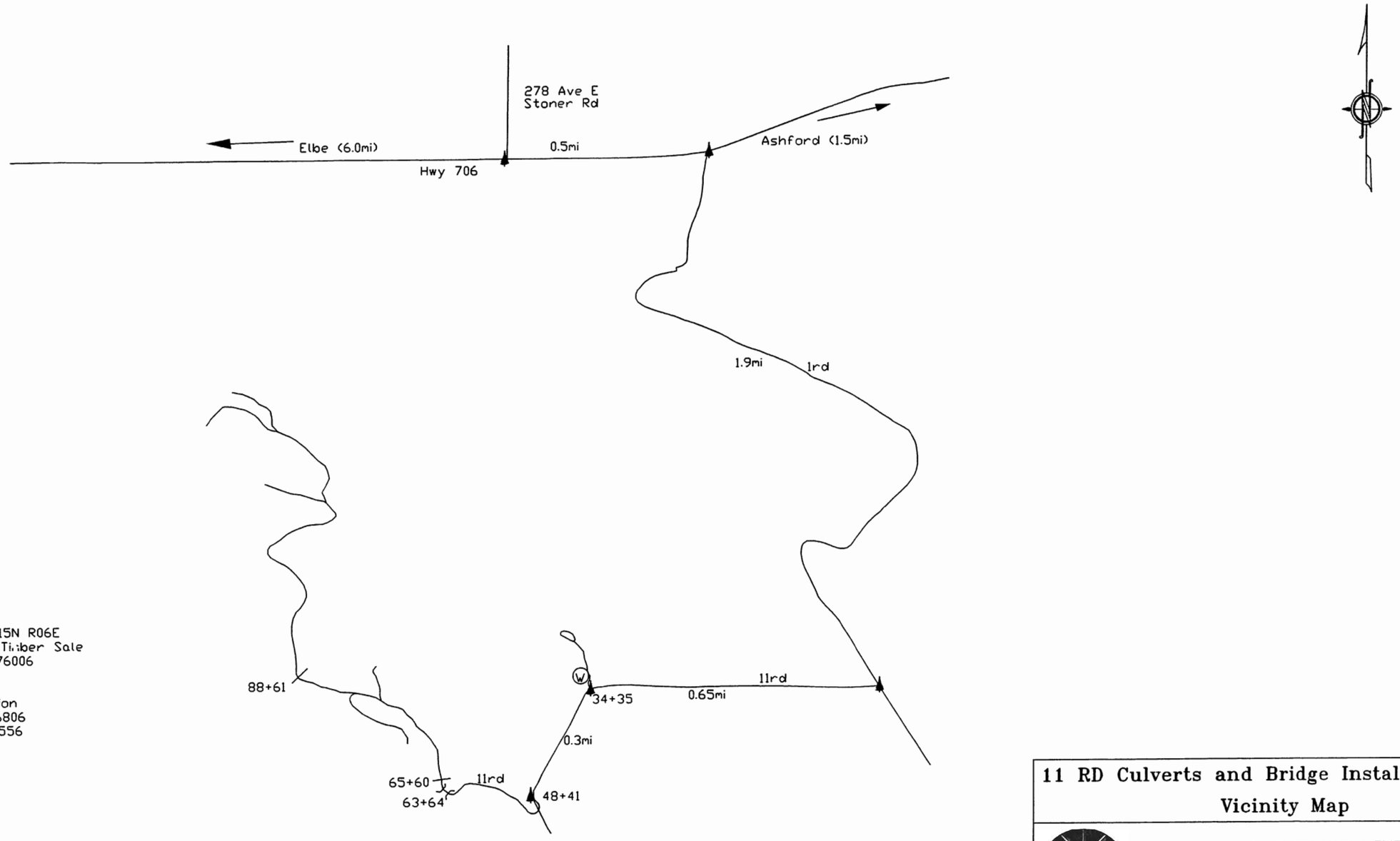
SURFACE

Road Number	From Station	To Station	Rock Slope	Compacted Rock Depth	C.Y./ Station	# of Stations	C.Y. Total	Rock Source
			K1	B1	4-Inch In Place			
11	30+00	42+00	2:1	1'	52	12	624	Zig Zag Pit
					2 ½ Inch Minus Crushed			
11	61+29	63+64	2:1	6"	24	2.4	58	Commercial Source
11	64+24	66+12	2:1	6"	24	1.9	46	Commercial Source
11	65+60						41	Commercial Source (Culvert Installation)
11	88+610						63	Commercial Source (Culvert Installation)

4- Inch In Place SURFACE TOTAL 624 Cubic Yards
2 ½ Inch Minus Crushed SURFACE TOTAL 208 Cubic Yards

*Optional Rock: If Purchaser elects to haul on optional rock roads in wet weather, the depth listed above is recommended but not required.

NOTE: Yardages are estimated on a compacted (In-Place) basis. Compliance of required rock will be based on compacted depth measurement.



SE1/4 Sec. 32 T15N R06E
The Big Kahuna Timber Sale
Contract #30-076006
County: Lewis

Bridge Installation
Longitude: 122.06806
Latitude: 46.73556

Project Sites:

63+64 Bridge Installation
65+60 48" x 40' Culvert Installation
88+61 72" x 70' Culvert Installation

(W) Waste Area

Date: 7/28/2004
Scale : none
Assembled By: MDB

11 RD Culverts and Bridge Installations
Vicinity Map

WASHINGTON STATE DEPARTMENT OF
Natural Resources
SPS Region

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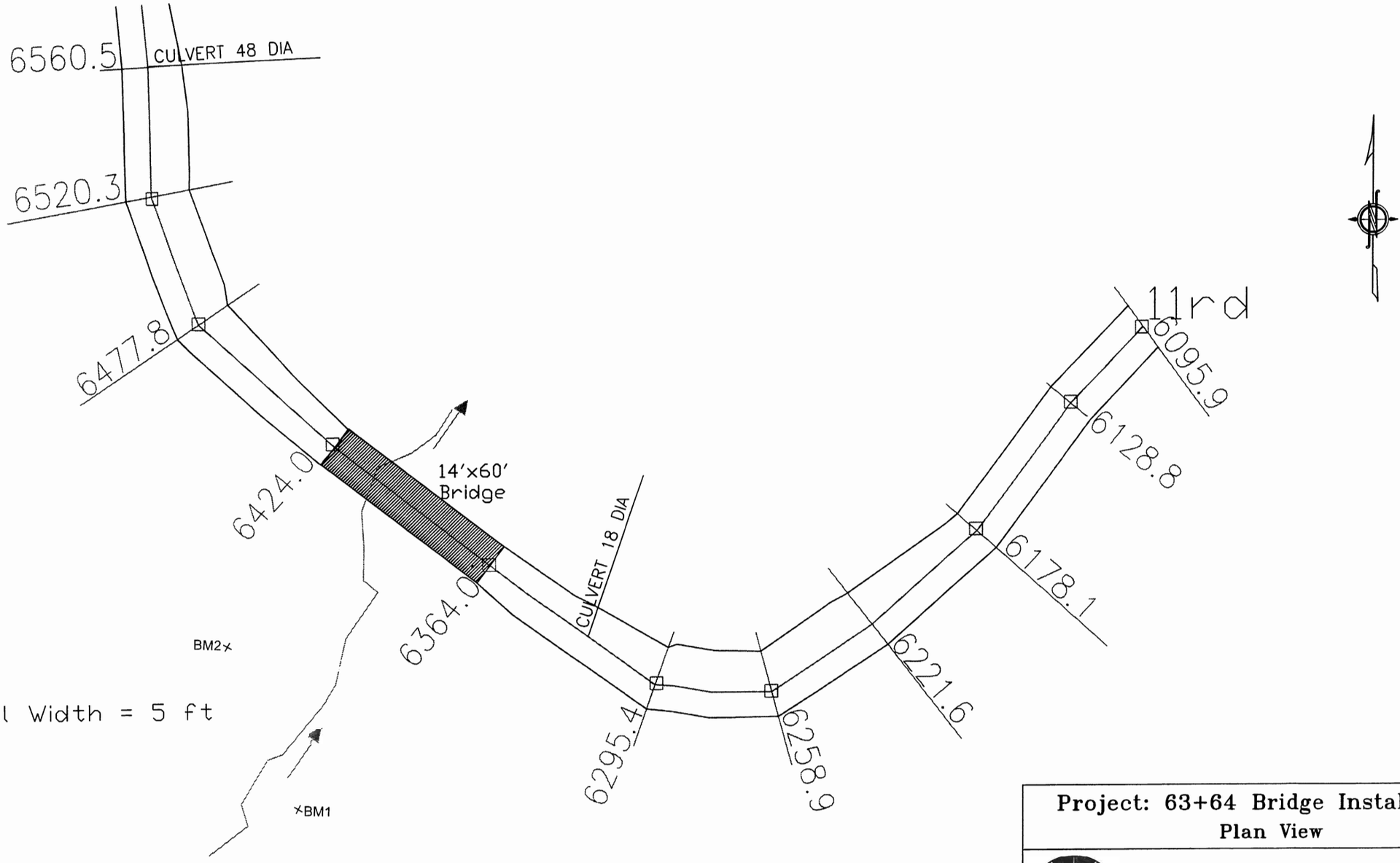
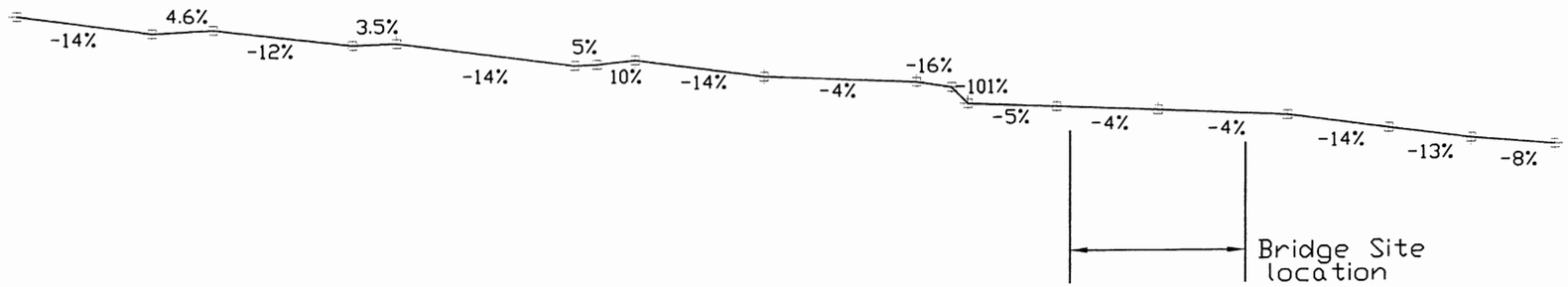


SE1/4 Sec. 32 T15N R06E
The Big Kahuna Timber Sale Contract
#30-076006
County: Lewis
Longitude: 122.06806
Latitude: 46.73556

Date: 7/28/2004
Scale : 1"= 40'
Drawn By: MDB

Project: 63+64 Bridge Installation
Plan View

WASHINGTON STATE DEPARTMENT OF
Natural Resources
SPS Region



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The Big Kahuna Timber Sale Contract #30-076006
County: Lewis
Longitude: 122.06806
Latitude: 46.73556

Date: 7/28/2004
Scale : 1"= 20'
Drawn By: MDB

Project: 63+64 Bridge Installation
Stream Profile

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Natural Resources
SPS Region

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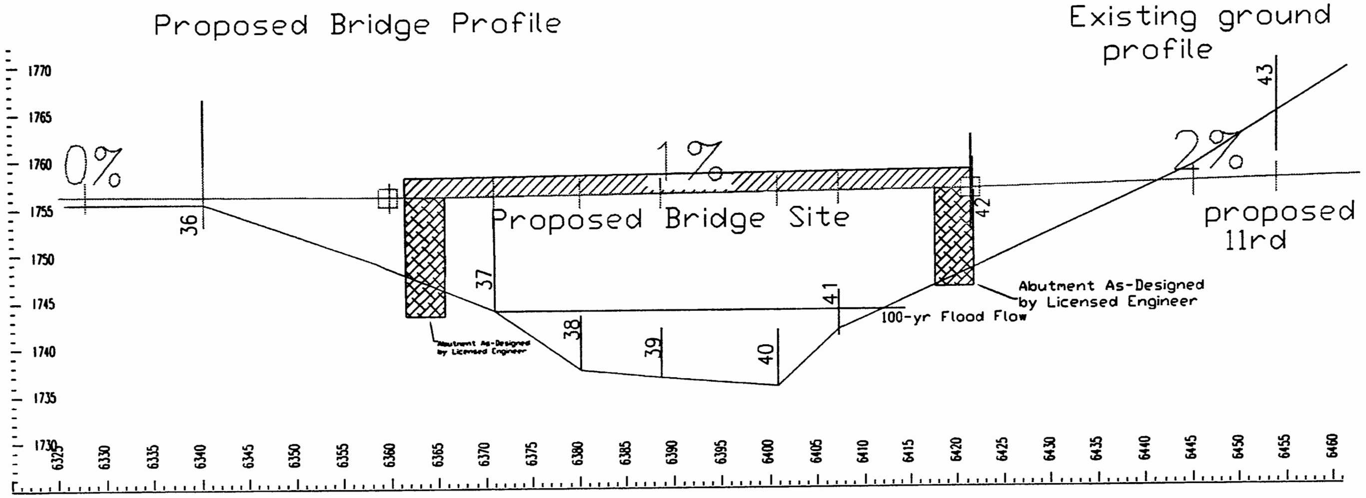
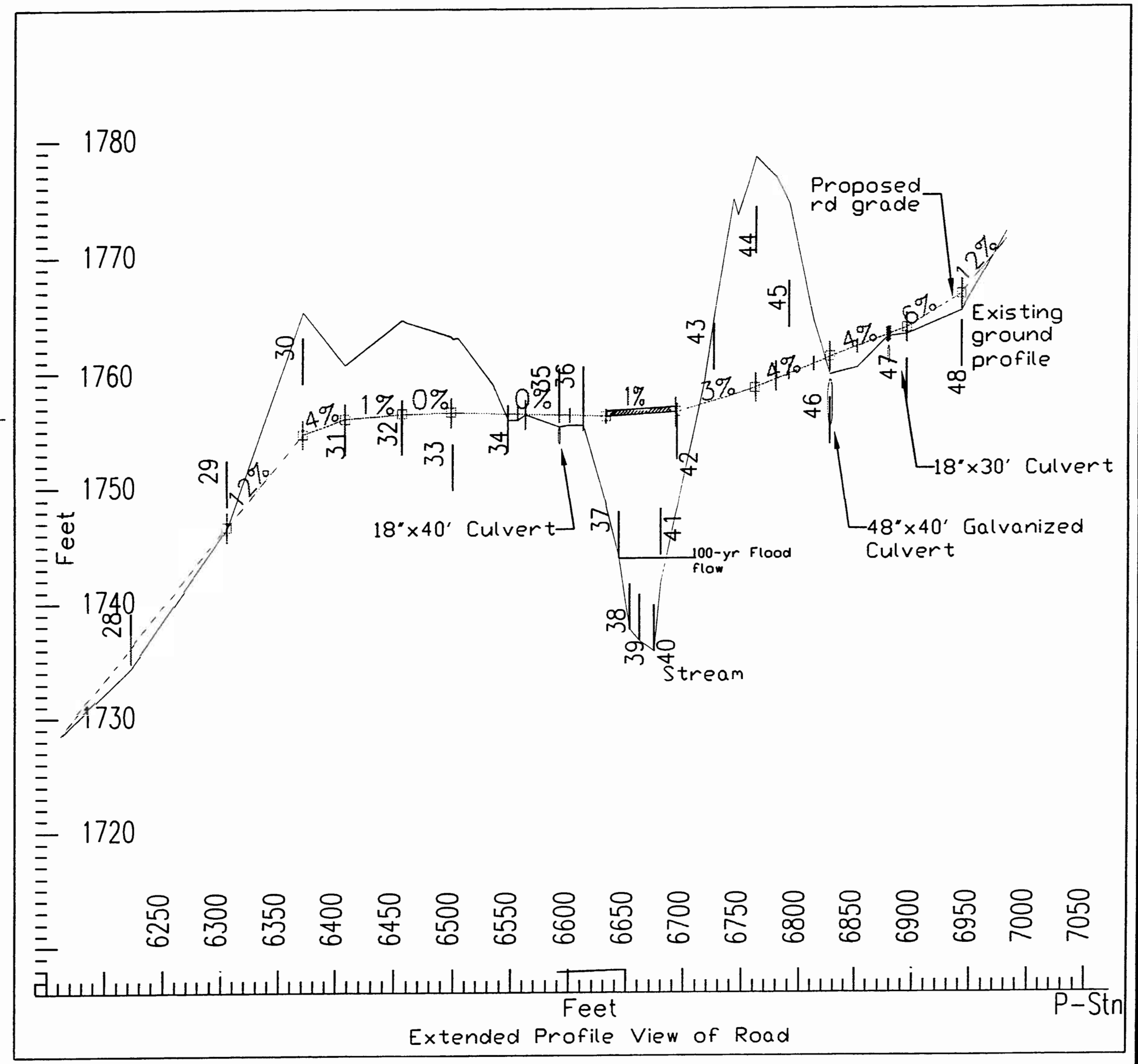


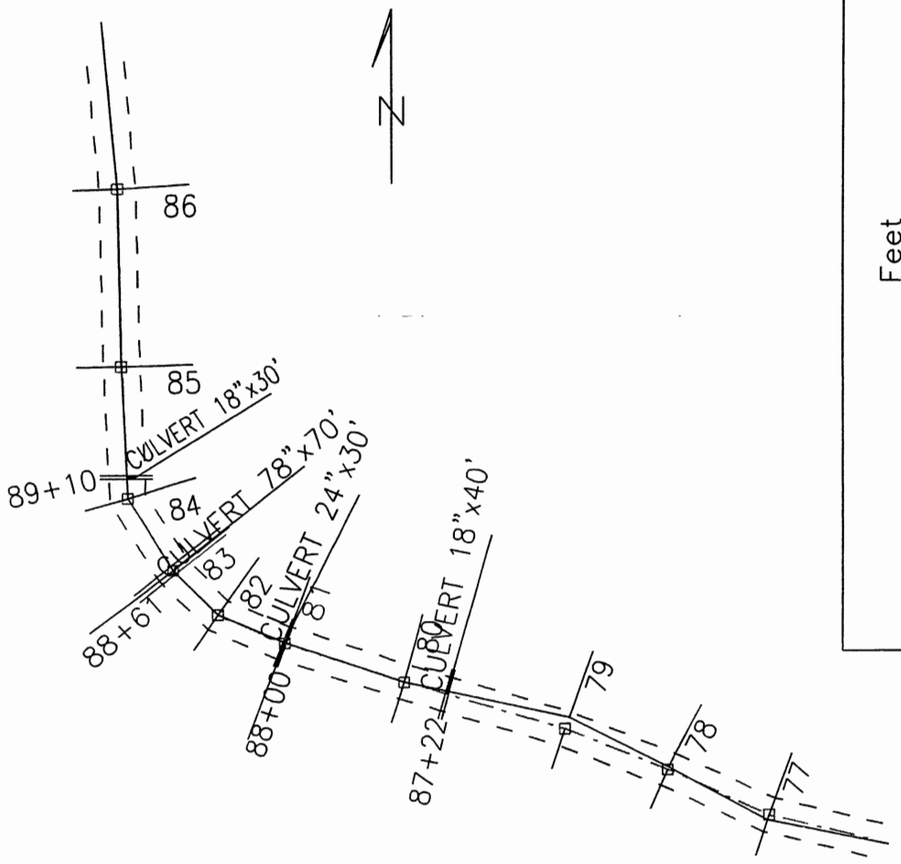


SE1/4 Sec. 32 T15N R06E
The Big Kahuna Timber Sale Contract #30-076006
County: Lewis
Longitude: 122.06806
Latitude: 46.73556

Date: 7/28/2004
Drawn by: MDB

Project 63+64 Bridge Installation
Profile Views

WASHINGTON STATE DEPARTMENT OF
Natural Resources
SPS Region



Plan View
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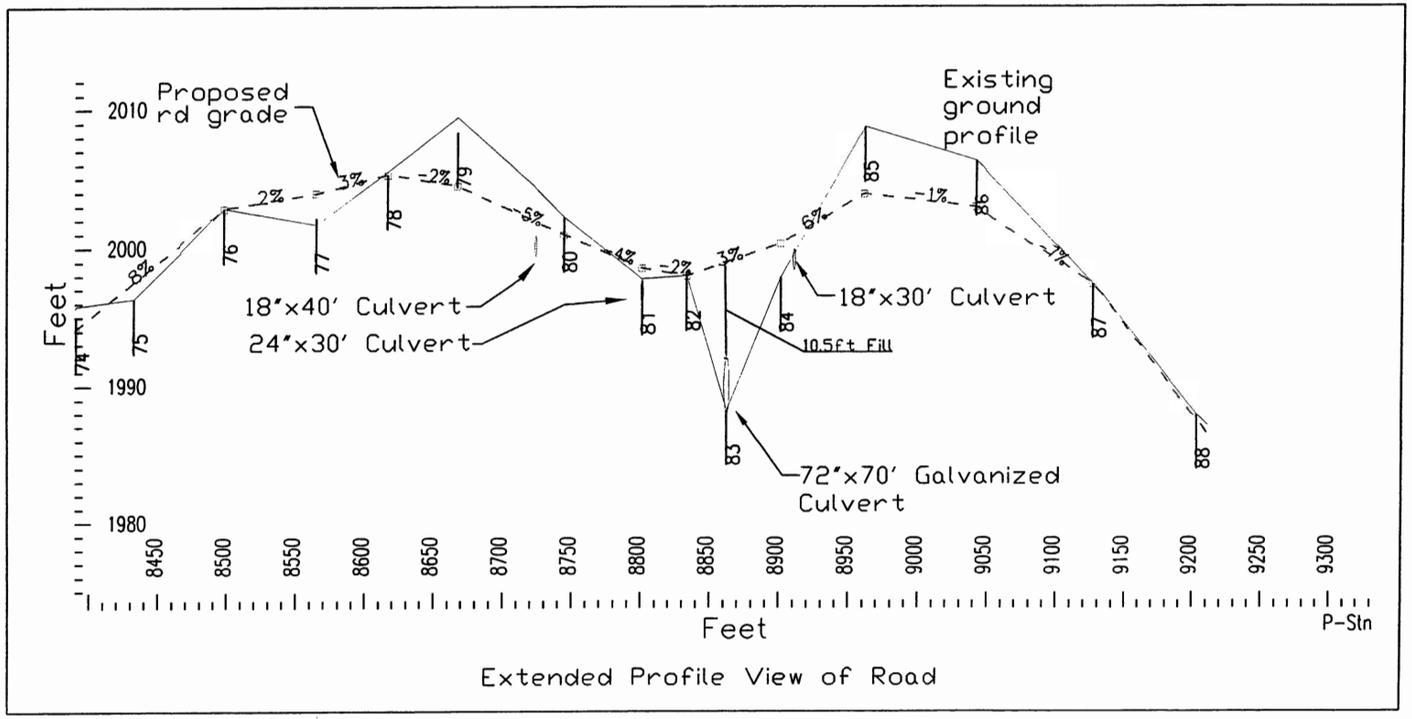

Profile View

SE1/4 Sec. 32 T15N R06E
The Big Kahuna Timber Sale Contract #30-076006
County: Lewis
Longitude: 122.06806
Latitude: 46.73556

Date: 7/28/2004
Drawn by: MDB

Project 88+61 Culvert Installation
Plan and Profile Views

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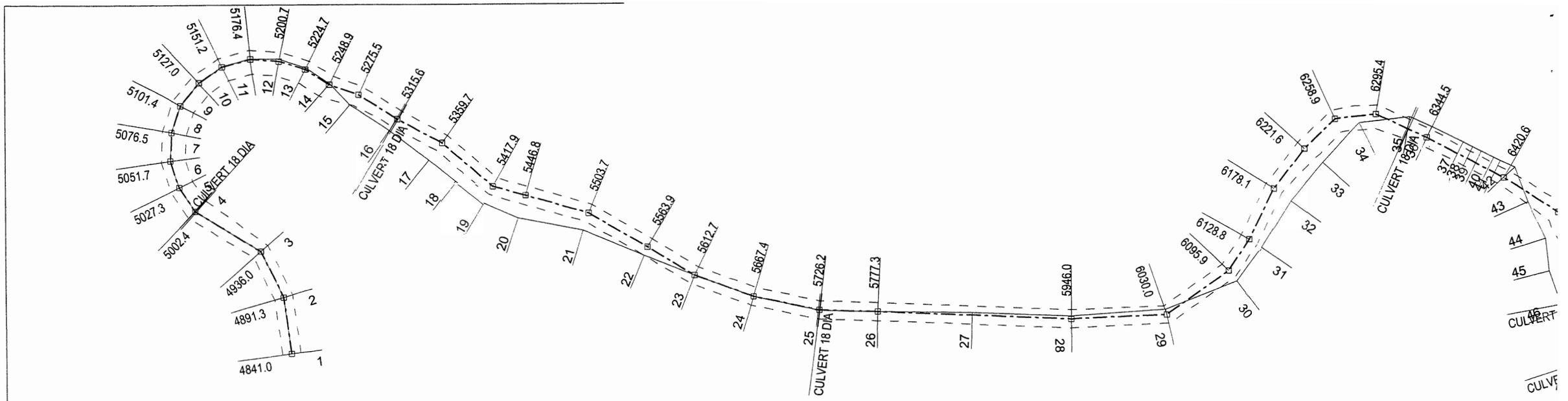
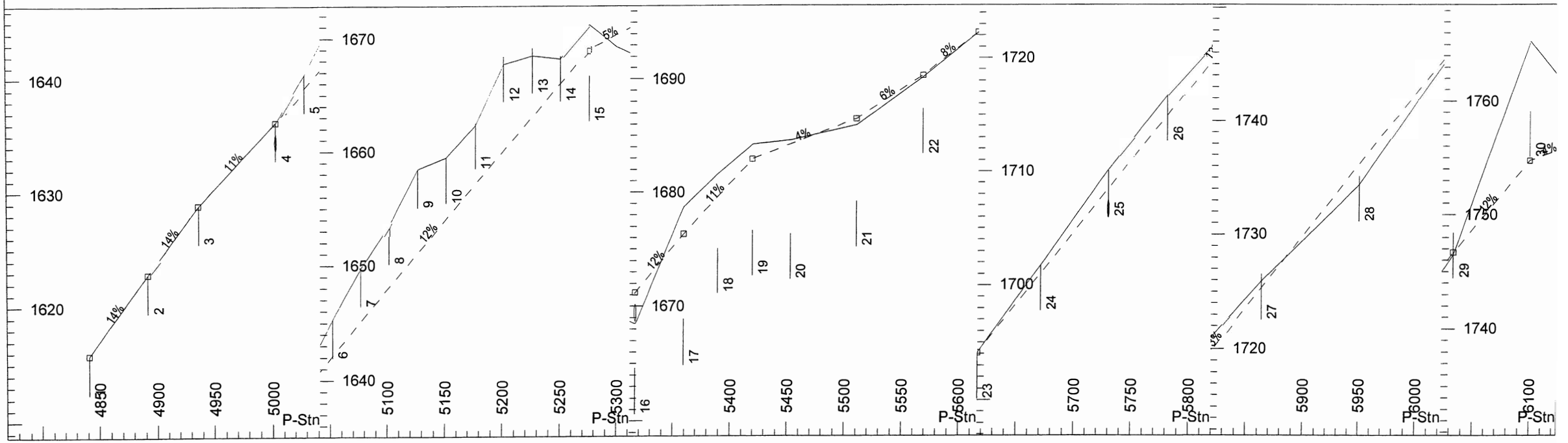
Natural Resources
SPS Region





The Big Kahuna Timber Sale 11 RD July 28, 2004 Contract #: 30-076006	Washington State Department of Natural Resources South Puget Sound Region	Plan Scale 1:1200 Profile Vert Scale 1:120 Profile Horz Scale 1:1200	Engineer: M. Bell Page 1 of 8 04/11/01

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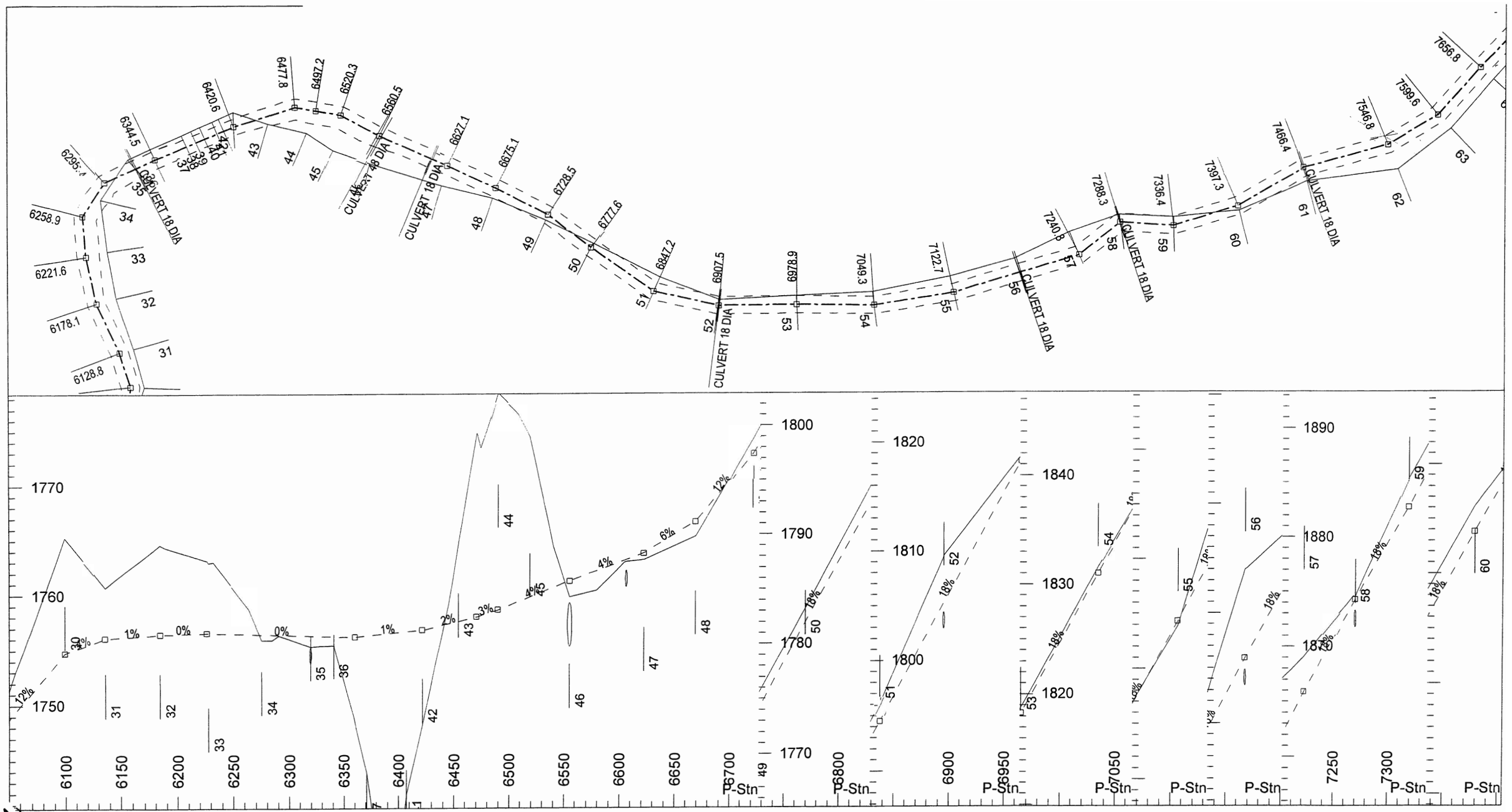

The Big Kahuna Timber Sale
11 RD July 28, 2004
Contract #: 30-076006

Washington State Department of Natural Resources
South Puget Sound Region

Plan Scale 1:1200
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Profile Horz Scale 1:1200

Engineer: M. Bell
04/11/01

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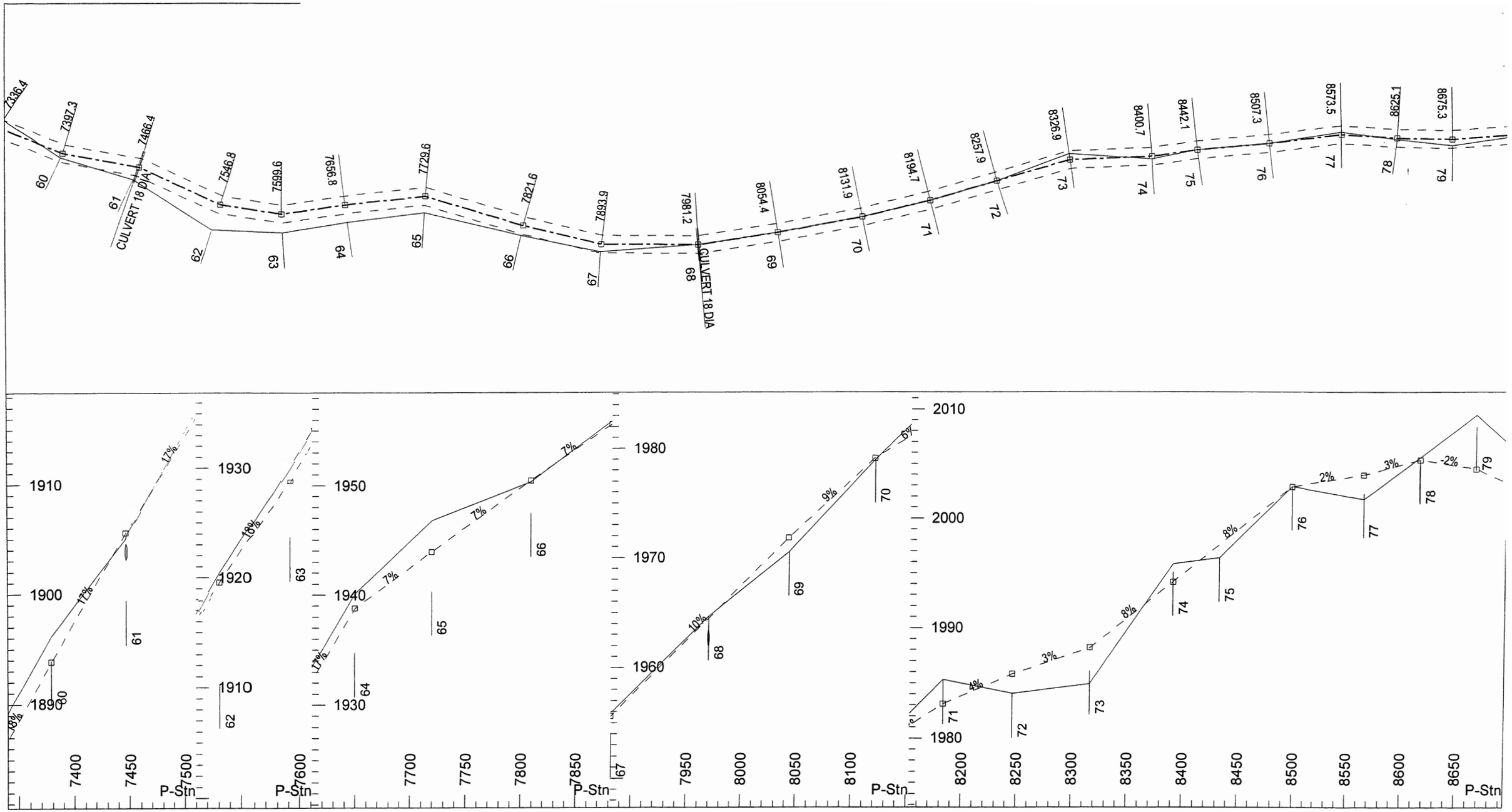

The Big Kahuna Timber Sale
11 RD July 28, 2004
Contract #: 30-076006

Washington State Department of Natural Resources
South Puget Sound Region

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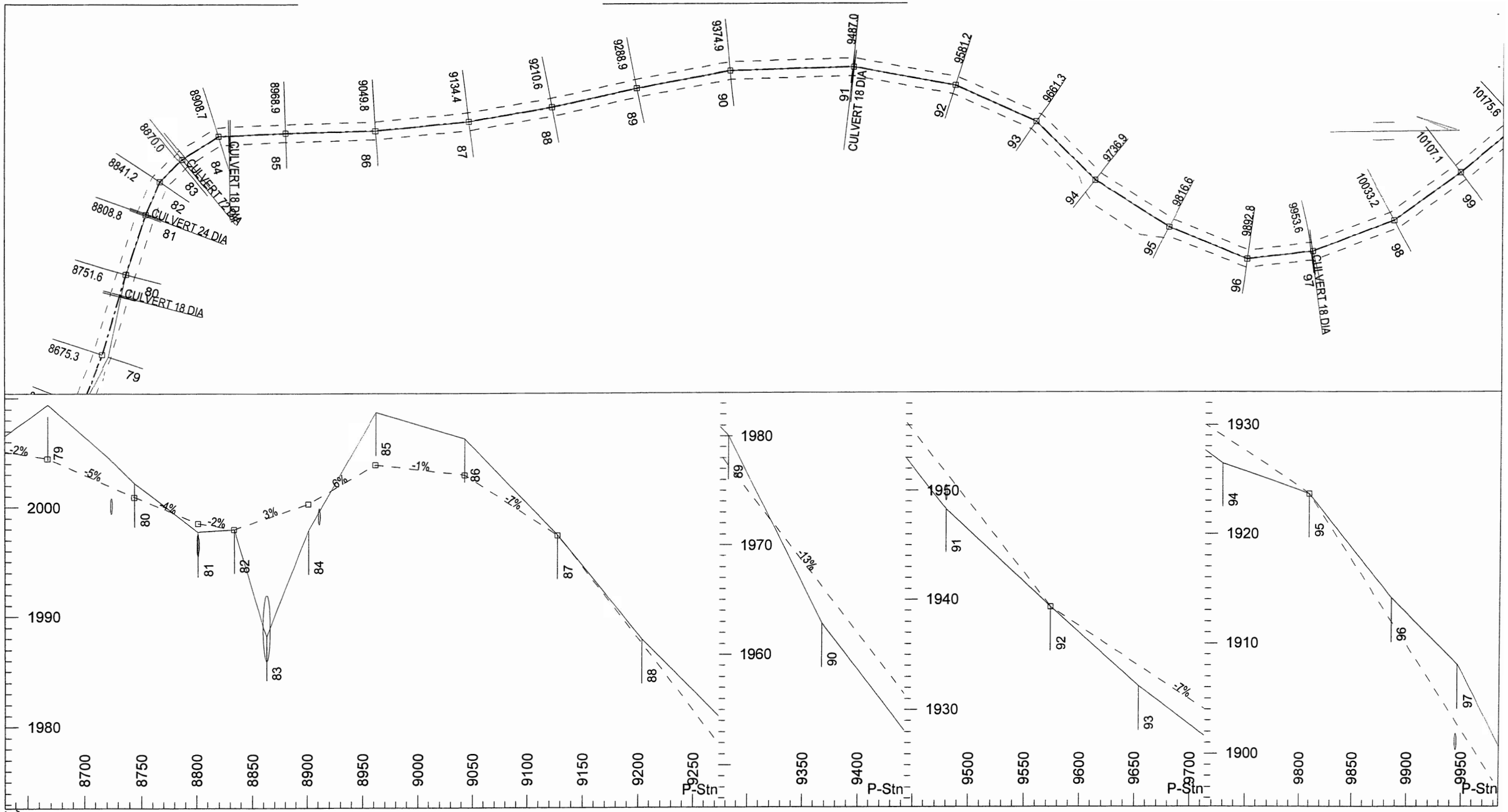
Engineer: M. Bell
04/11/01



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South Puget Sound Region

Plan Scale 1:1200
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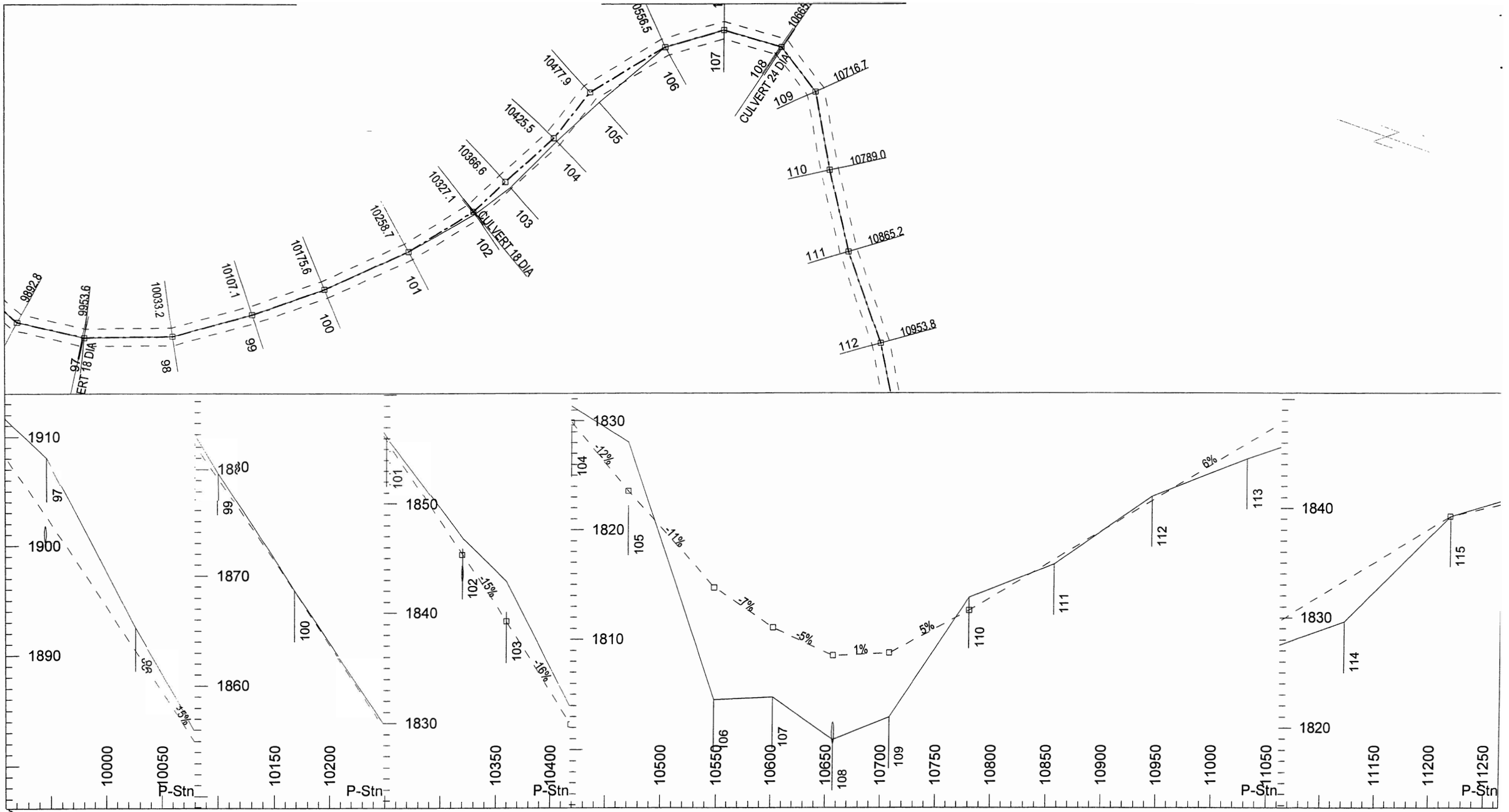
Profile Horz Scale 1:1200

Engineer: M. Bell
04/11/01



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Contract #: 30-076006

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South Puget Sound Region

Plan Scale 1:1200
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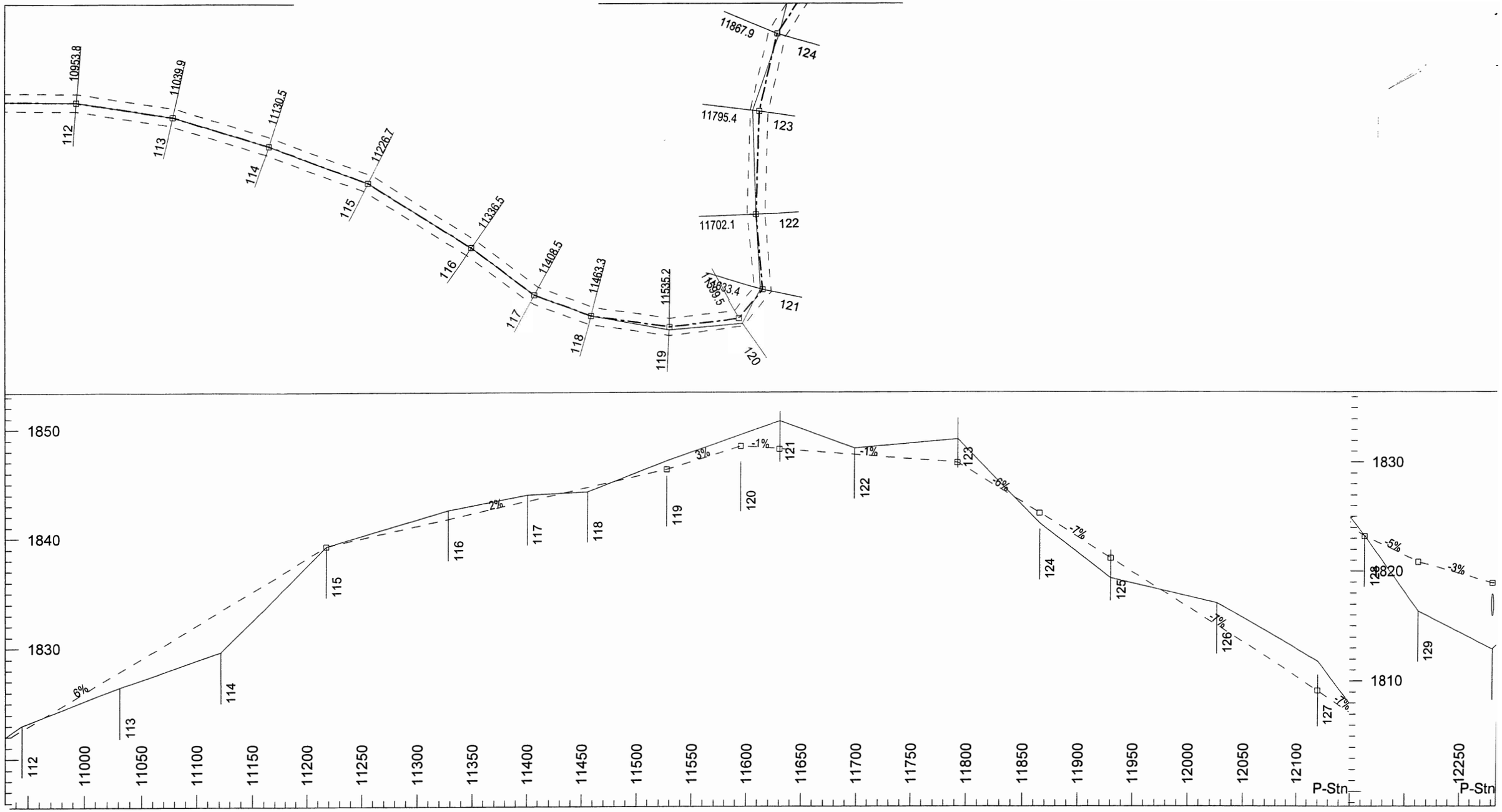
Profile Horz Scale 1:1200

Engineer: M. Bell
04/11/01



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South Puget Sound Region

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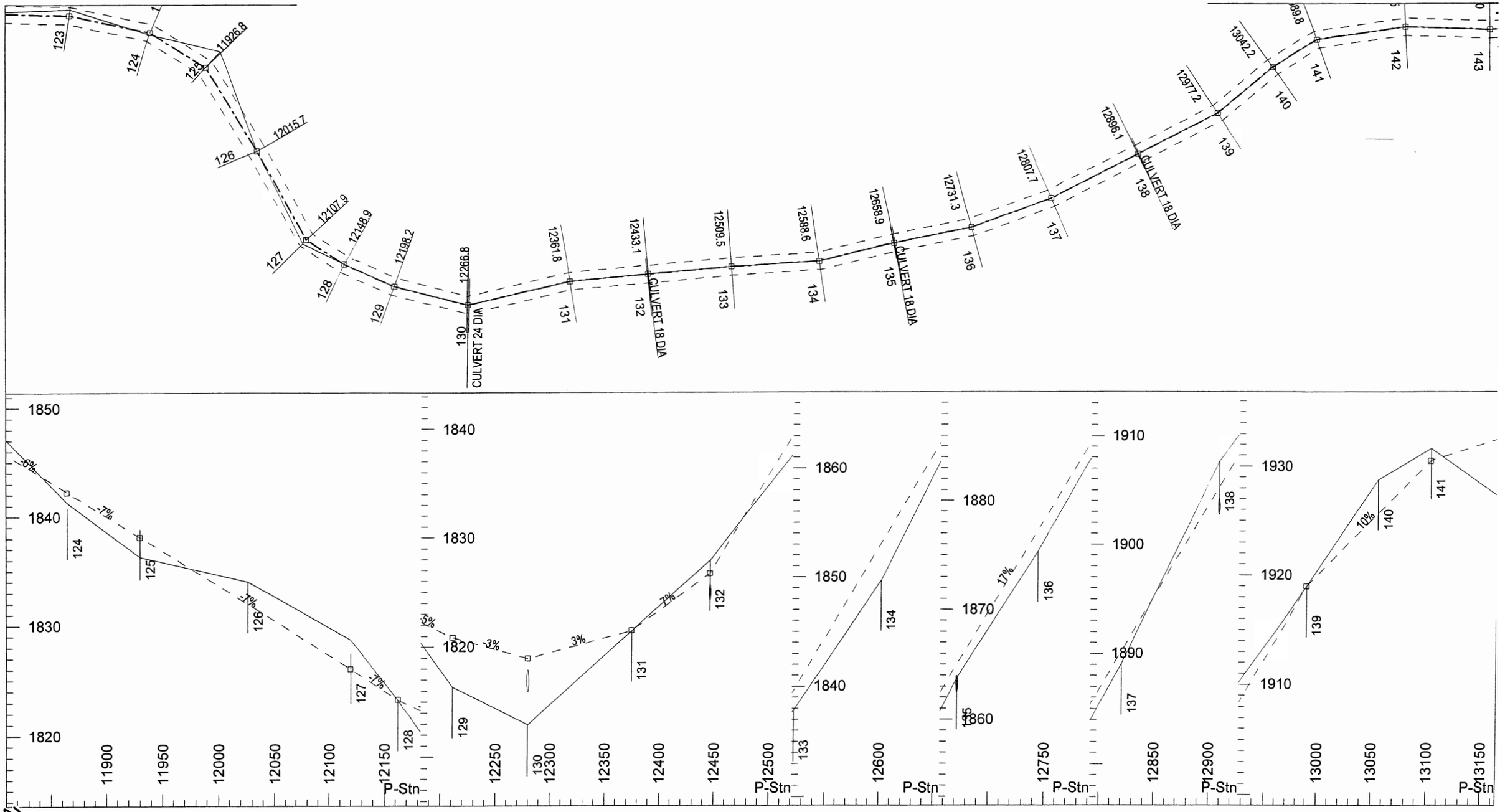
Engineer: M. Bell
04/11/01



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South Puget Sound Region

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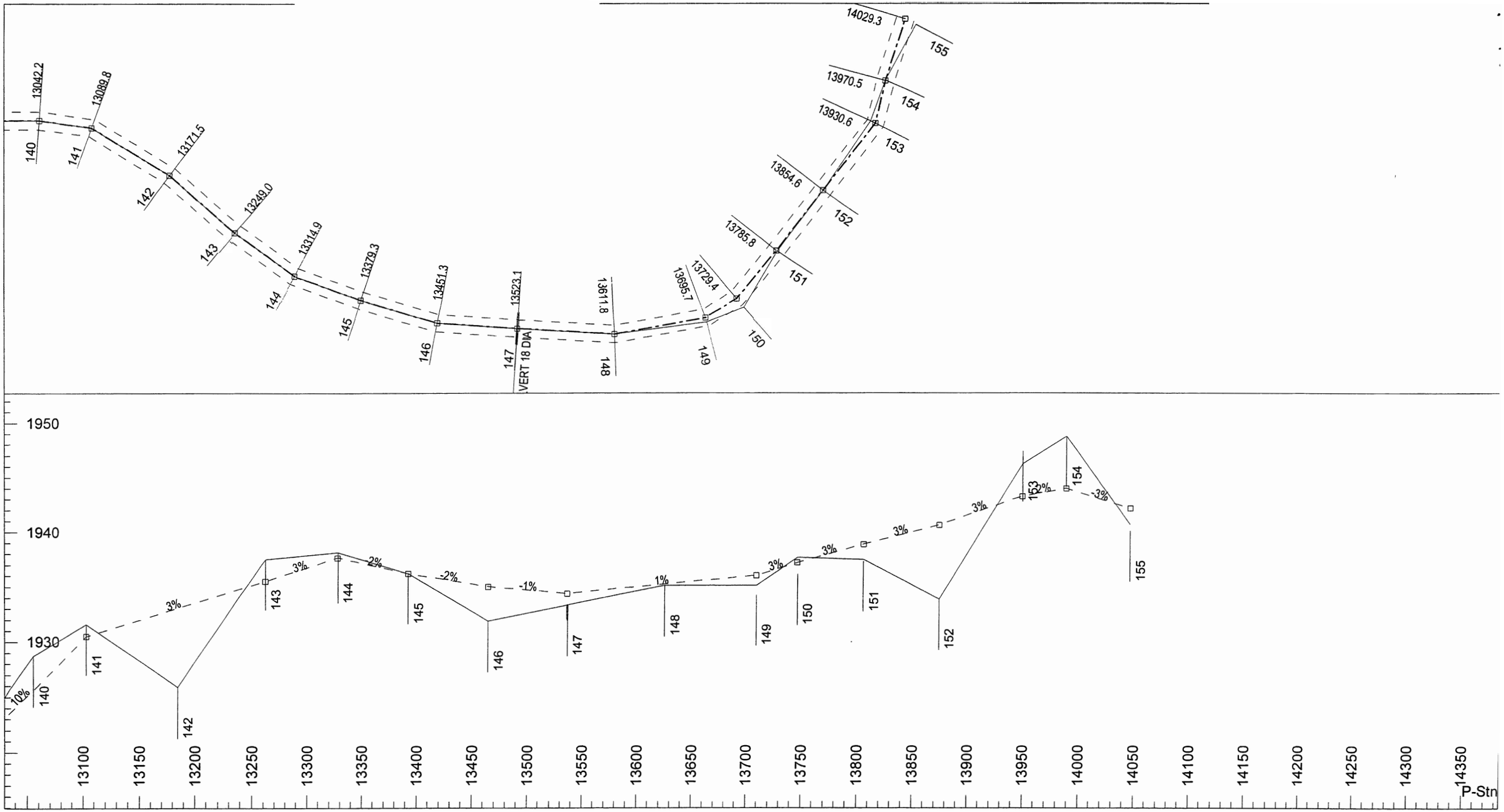
Engineer: M. Bell
04/11/01



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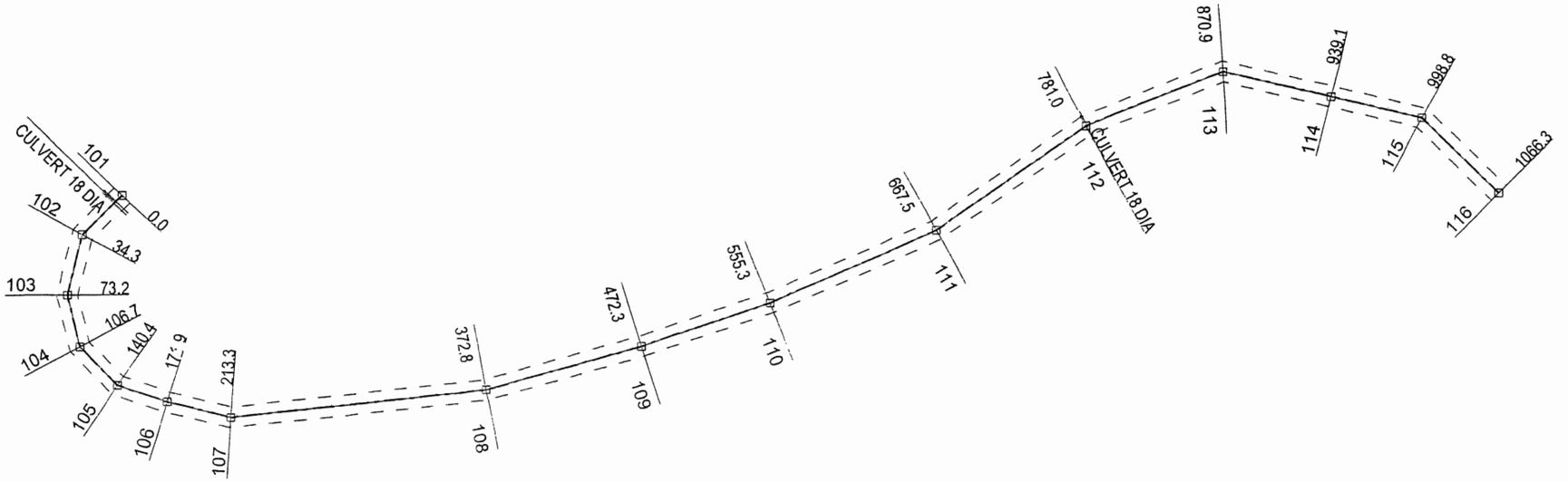
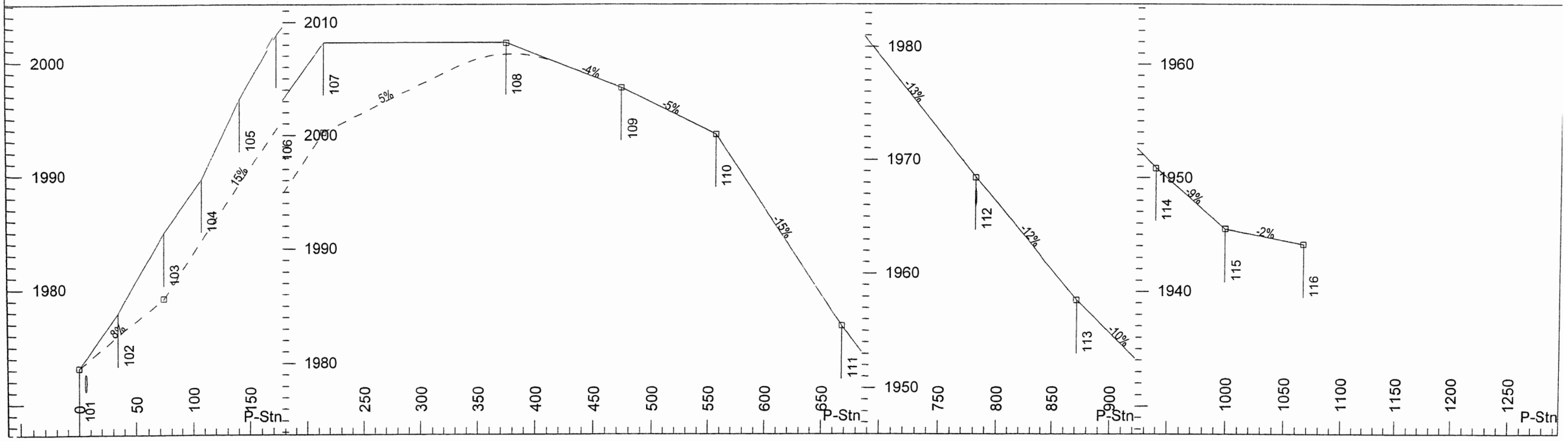
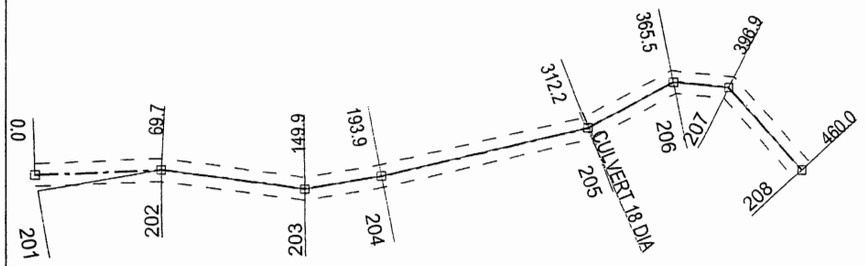
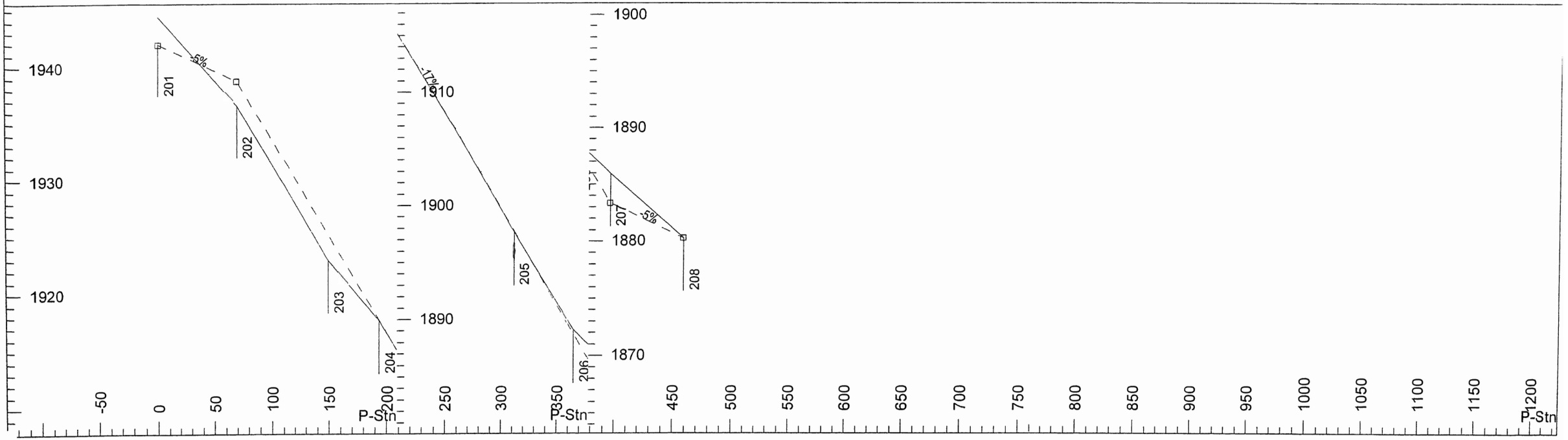




The Big Kahuna Timber Sale 111 RD July 28, 2004 Contract #: 30-076006	Washington State Department of Natural Resources South Puget Sound Region	Plan Scale 1:1200 Profile Vert Scale 1:120 Profile Horz Scale 1:1200	Engineer: C. Forsyth Page 1 of 1 04/08/03





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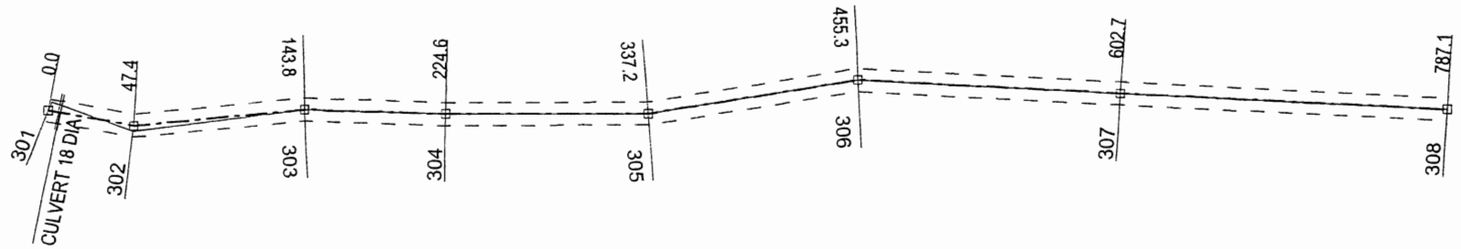

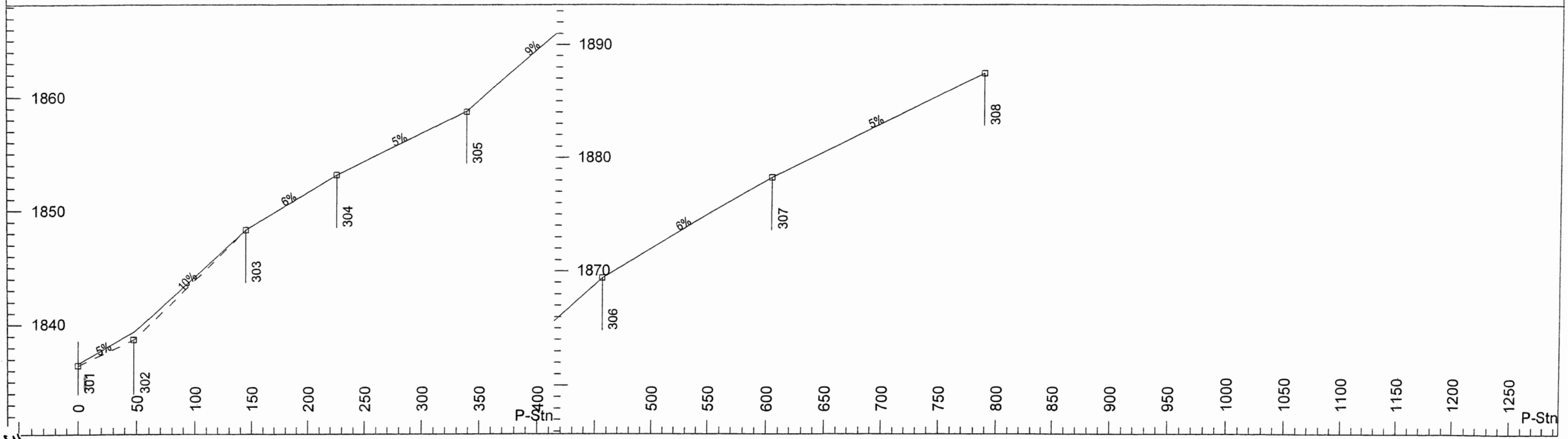

The Big Kahuna Timber Sale 113 RD July 28, 2004 Contract #: 30-076006	Washington State Department of Natural Resources South Puget Sound Region	Plan Scale 1:1200 Profile Vert Scale 1:120 Profile Horz Scale 1:1200	Engineer: C. Forsyth Page 1 of 1 04/08/03

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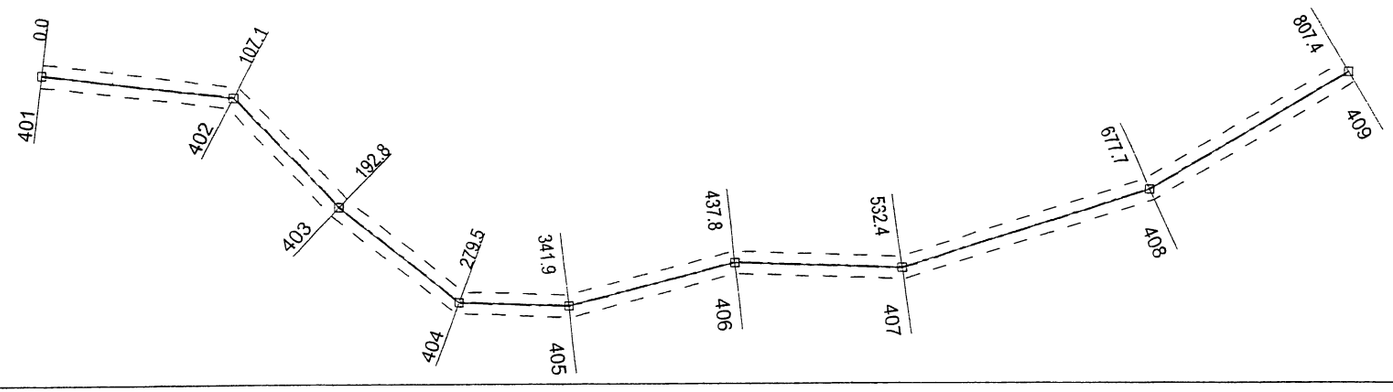

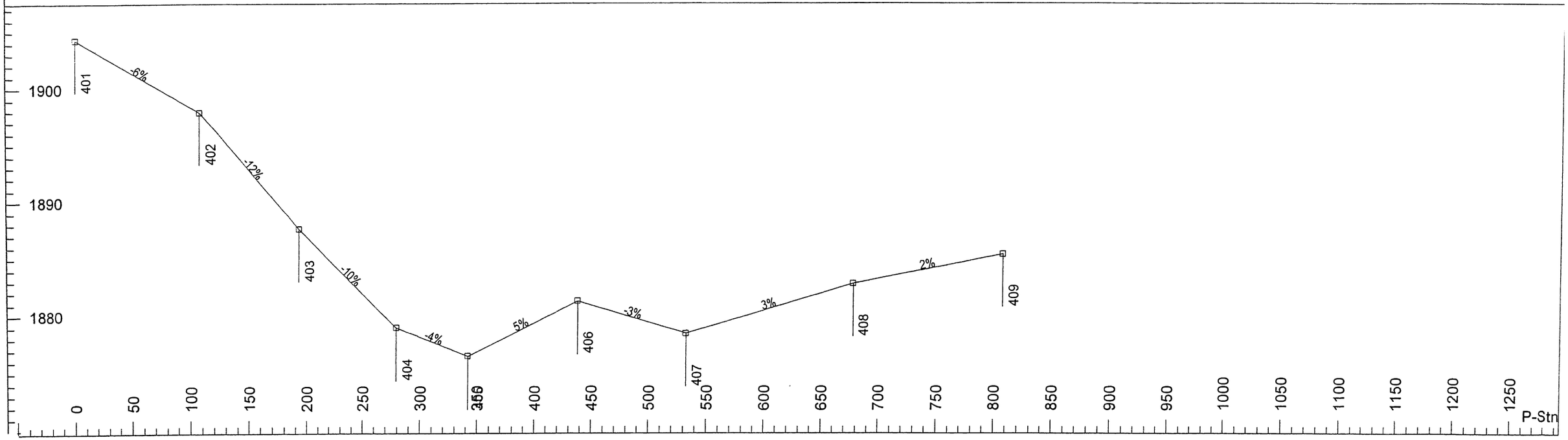

The Big Kahuna Timber Sale
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Profile Horz Scale 1:1200

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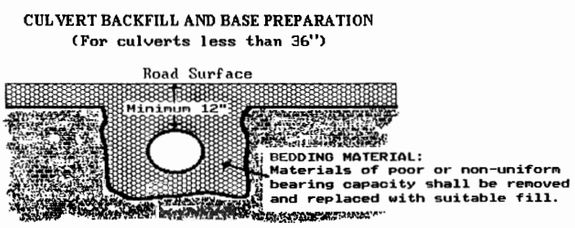
CULVERT LIST

Road Number	Location	Culvert Dia.	Culvert Type	Length (ft) Culvert	Downspt	Flume	Riprap (C.Y.) Inlet	Outlet	Type	Backfill Material	Placement Method	Const. Staked	Remarks
11	50+03	18"	PD	40'	0	0	0.2	0.2	SR or QS	NT or SL			
11	53+16	18"	PD	30'	0	0	0.2	0.2	SR or QS	NT or SL			
11	57+26	18"	PD	30'	0	0	0.2	0.2	SR or QS	NT or SL			
11	63+26	18"	PD	40'	0	0	0.2	0.2	SR or QS	NT or SL			
11	65+60	48"	GS14	40'	0	0	1	1	LL	SR or SL			Type 4 stream. See HPA.
11	66+03	18"	PD	30'	0	0	0.2	0.2	SR or QS	NT or SL			
11	68+99	18"	PD	30'	0	0	0.2	0.2	SR or QS	NT or SL			
11	71+77	18"	PD	40'	0	0	0.2	0.2	SR or QS	NT or SL			
11	72+80	18"	PD	30'	0	0	0.2	0.2	SR or QS	NT or SL			
11	74+57	18"	PD	30'	0	0	0.2	0.2	SR or QS	NT or SL			
11	79+72	18"	PD	30'	0	0	0.2	0.2	SR or QS	NT or SL			
11	87+22	18"	PD	40'	0	0	0.2	0.2	SR or QS	NT or SL			
11	88+00	24"	GS16	30'	0	0	0.2	0.2	SR or QS	NT or SL			Type 5 stream. See HPA.
11	88+61	72"	GS12	70'	0	0	1	1	LL	SR or SL			Type 3 stream. See HPA.
11	89+10	18"	PD	30'	0	0	0.2	0.2	SR or QS	NT or SL			
11	94+78	18"	PD	30'	0	0	0.2	0.2	SR or QS	NT or SL			
11	99+43	18"	PD	40'	0	0	0.2	0.2	SR or QS	NT or SL			
11	103+18	18"	PD	30'	0	0	0.2	0.2	SR or QS	NT or SL			
11	106+57	24"	TEMP	50'	0	0	0.2	0.2	SR or QS	NT or SL			Type 5 stream. See HPA.
11	122+58	24"	TEMP	50'	0	0	0.2	0.2	SR or QS	NT or SL			
11	124+24	18"	TEMP	30'	0	0	0.2	0.2	SR or QS	NT or SL			
11	126+50	18"	TEMP	30'	0	0	0.2	0.2	SR or QS	NT or SL			
11	128+87	18"	TEMP	30'	0	0	0.2	0.2	SR or QS	NT or SL			
11	135+14	18"	TEMP	30'	0	0	0.2	0.2	SR or QS	NT or SL			
111	0+36	18"	TEMP	30'	0	0							
111	7+81	18"	TEMP	30'	0	0							
112	3+12	18"	TEMP	30'	0	0							
113	0+06	18"	TEMP	30'	0	0							

PD = Polyethylene Pipe Dual Wall AASHTO No. M294 Type S
GS16 = Galvanized Steel AASHTO No. M36, 16 Gauge
GS14 = Galvanized Steel AASHTO No. M36, 14 Gauge
GS12 = Galvanized Steel AASHTO No. M36, 12 Gauge
TEMP = Temporary Culvert

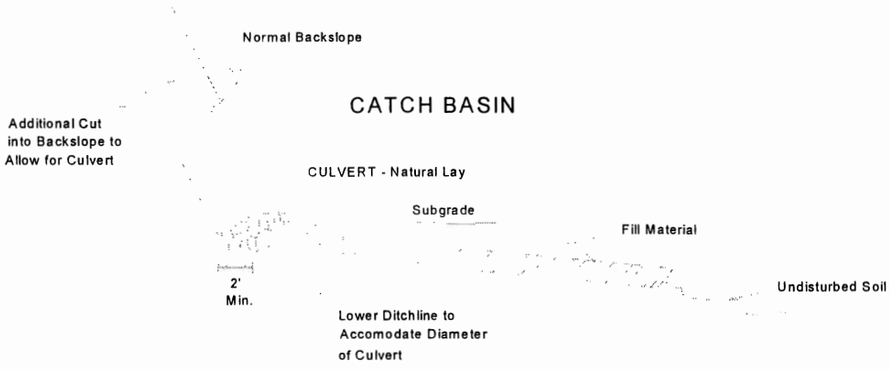
Key:

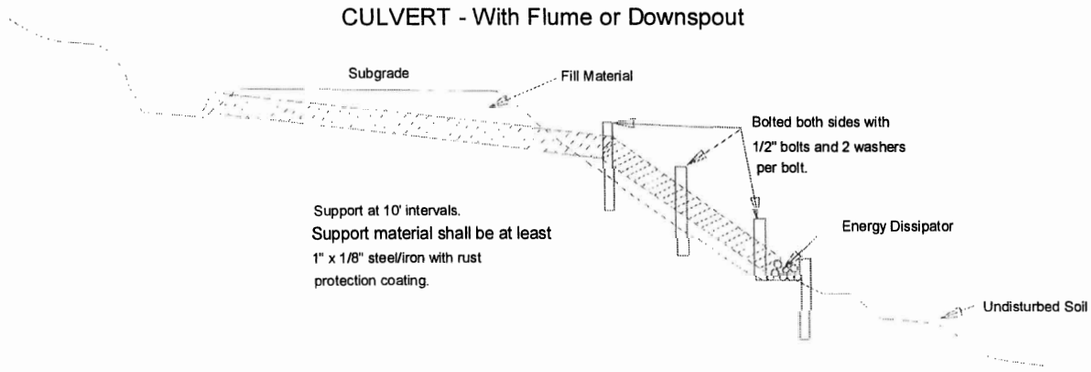
QS - Quarry Spalls
SR - Shot Rock
NT - Native (bank run)
SL - Select Fill
HL - Heavy Loose Riprap
LL - Light Loose Riprap
Flume - Half round pipe
Downspout - Full round pipe



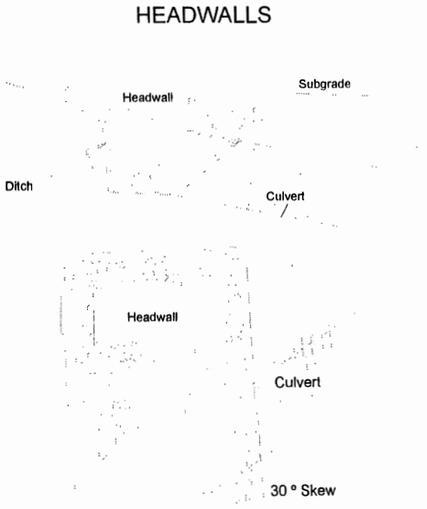
CULVERT AND DRAINAGE SPECIFICATION DETAIL

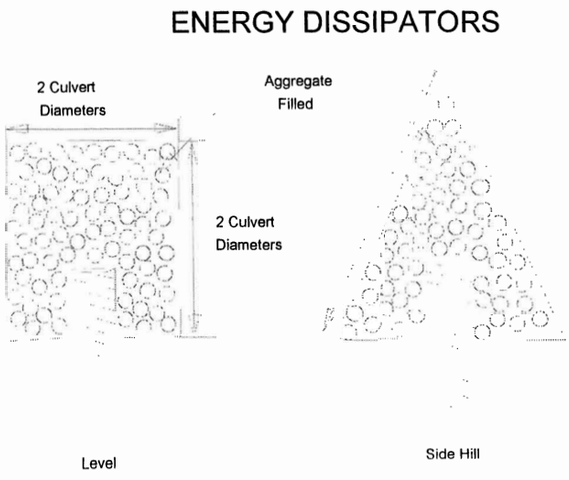
(Page 1 of 2)





Proper preparation of foundation and placement of bedding material shall precede the installation of all culvert pipe. This includes necessary leveling of the native trench bottom and compaction of required bedding material to form a uniform dense unyielding base. The backfill material shall be placed so that the pipe is uniformly supported along the barrel.





Headwalls to be constructed of material that will resist erosion.

Dissipator Specifications:
Depth: 1 culvert diameter
Aggregate: as specified in the CULVERT LIST.

CULVERT AND DRAINAGE SPECIFICATION DETAIL

(Page 2 of 2)

POLYETHYLENE PIPE INSTALLATION

INSTALLATION REQUIREMENTS:

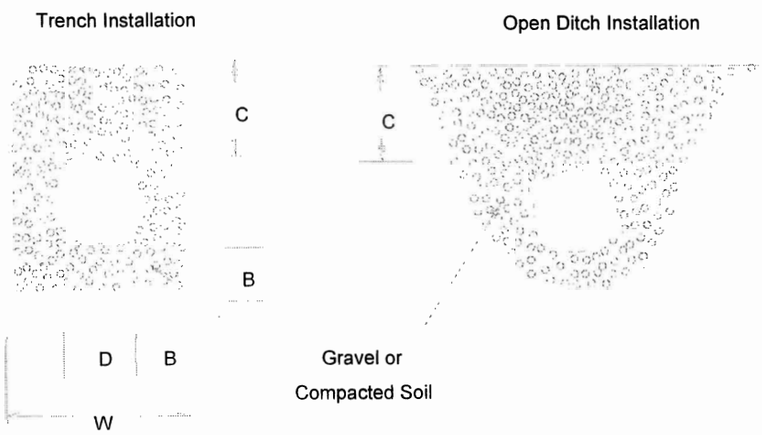
1. Crushed stone, gravel, or compacted soil backfill material shall be used as the bedding and envelope material around the culvert. The aggregate size shall not exceed 1/6 pipe diameter or 4" diameter, whichever is smaller.

2. The corrugated pipe shall be laid on grade, on a layer of bedding material as shown for the two types of installations. If native soil is used as the bedding and backfill material, it shall be well compacted in six inch layers under the haunches, around the sides and above the pipe to the recommended minimum height of cover.

3. Either crushed aggregate or flexible (asphalt) pavement may be laid as part of the minimum cover requirements.

4. Site conditions and availability of bedding materials often dictate the type of installation method used.

5. The load bearing capability of flexible conduits is dependent on the type of backfill material used and the degree of compaction achieved. Crushed stone and gravel backfill materials typically reach a compaction level of 90-95% AASHTO standard density without compaction. When native soils are used as backfill material, a compaction level of 85% is required. This minimum compaction can be achieved by either hand or mechanical tamping.



MINIMUM DIMENSIONS
Trench or Open Ditch Installation

Nominal Diameter	Minimum Thickness	Minimum Cover	Min. Trench Width
D	B	C	W
18"	6"	12"	36"
24"	6"	12"	42"
30"	6"	12"	48"
36"	6"	12"	54"

STATE OF WASHINGTON
DEPARTMENT OF NATURAL RESOURCES

FOREST ACCESS ROAD
MAINTENANCE SPECIFICATIONS

1. CONSTRUCTION AND RECONSTRUCTION (Prior to acceptance to the contract or acceptance on a timber sale).

A. Cuts and Fills
   1. Maintain slope lines as constructed. Remove slides from the ditches and roadway. Replace fills to 1 ½ : 1 slopes with selected material or as directed. Remove overhanging material from the cut slopes.
   2. Material from slides or other sources requiring removal shall not be deposited in streams or at locations where it will erode into streams or water courses.
   3. Undesirable slide materials and debris shall not be mixed into the surface material.

B. Surface
   1. Grade and shape the road surface, turnouts, and shoulders to the original crown, inslope or outslope as directed to provide suitable traveled surface and surface water runoff in an even, unconcentrated manner.
   2. Blading must not undercut the backslope at the bottom of the ditchline or cut geotextile at centerline.
   3. Watering may be required to control dust and to retain fine surface rock.
   4. Desirable surface material shall not be bladed off the roadway.
   5. Replace surface material lost or worn away.
   6. Remove berms except as directed by the State.
   7. Barrel spread soft spots to prevent degradation of geotextile.

C. Drainage
   1. Keep ditches and drainage channels at outlets and inlets of culverts clear of obstructions and functioning as intended.
   2. Inspect and clean culverts at least monthly, with additional inspections during storms and periods of high runoff. This must be done even during periods of inactivity.
   3. Add stable material at the outlet end of the culvert as needed to stabilize the stream bed.
   4. Headwalls: maintain to the road shoulder level with material that will resist erosion.
   5. Keep silt bearing surface runoff from getting into live streams.

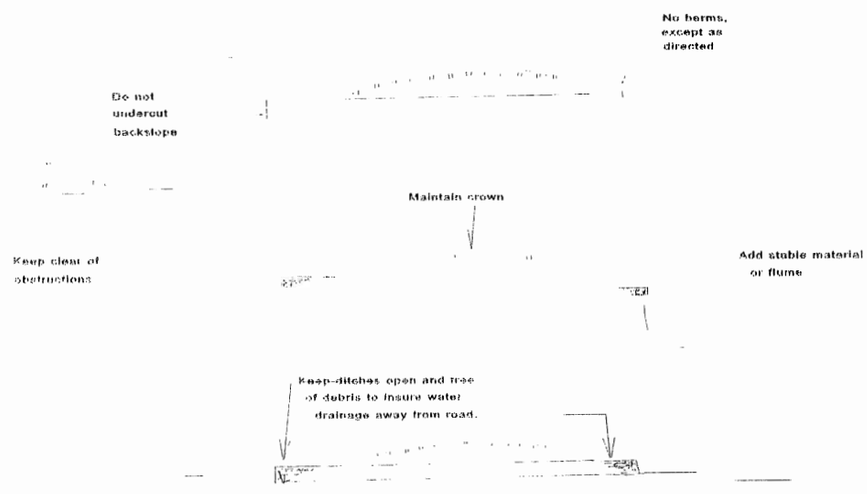
D. Structures
   Repair bridges, culverts, cattleguards, fences, and other road structures to the condition required by the construction specifications.

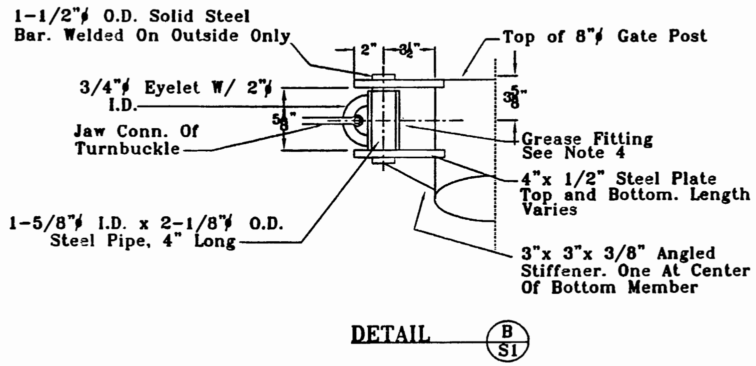
E. Termination of Use or End of Season
   Do maintenance work to minimize damage from the elements such as blading to insure correct runoff, ditch, and culvert cleaning and water bars.

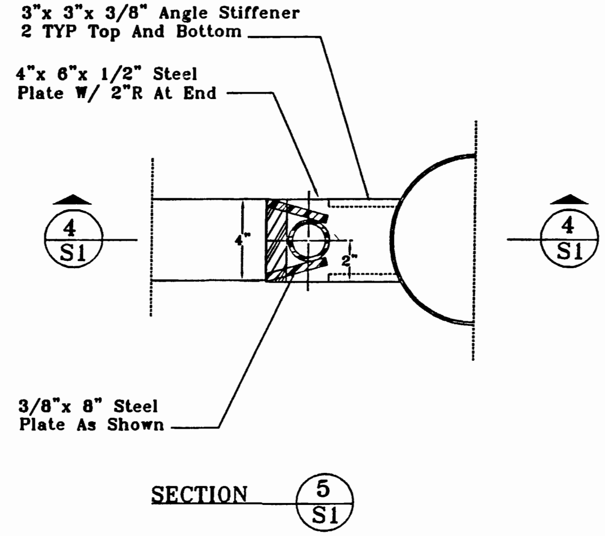
F. Debris
   Remove fallen timber, limbs, and stumps from the slopes or roadway.

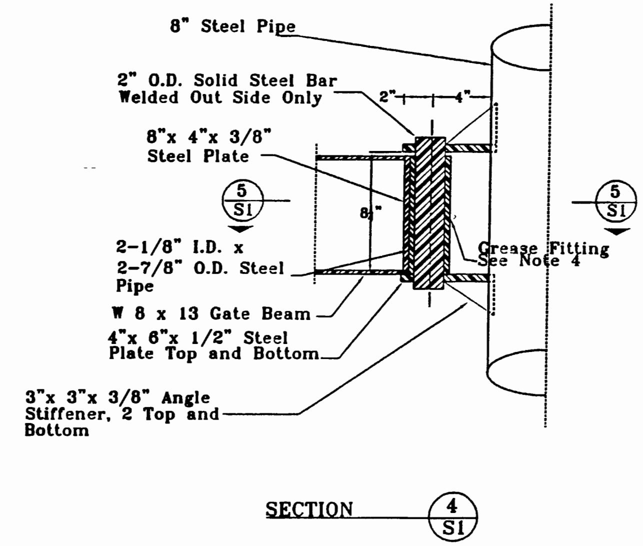
2. Existing Roads – Timber Sale, Operator Maintained
   A. Same as above but not to exceed the condition of the road on the date the contract was signed.

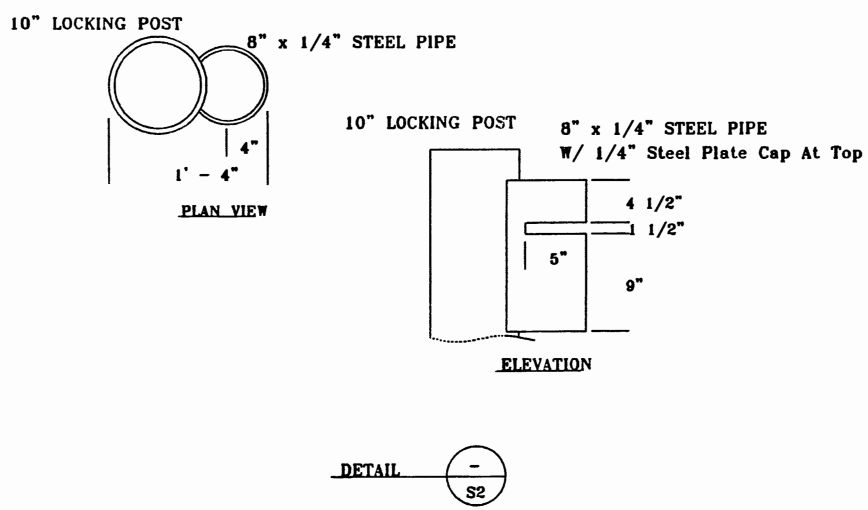
3. A.R.R.F. – Directed maintenance to comply with these specifications.

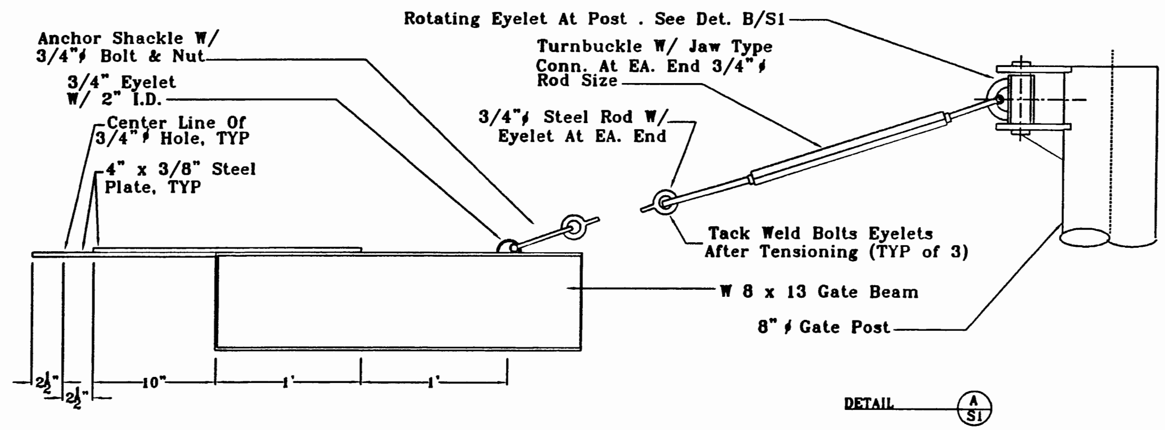












Date: 7/28/2004
Scale : None
Page : 2 of 2
Edited by: W.H.

Steel Gate Details

WASHINGTON STATE DEPARTMENT OF
Natural Resources
SPS Region

Gate Plan Detail

GENERAL NOTES:

1. Fabrication materials shall meet the following criteria:
   - A. Non-Structural steel bars, plates and items — ASTM A36 or ASTM A283 Steel
   - B. Pipe columns — ASTM A53 and ASTM A120, Grade B Steel
   - C. Steel bolts — ASTM A307, Grade A Steel
   - D. Standard rolled steel sections — ASTM A36
   - E. Structural steel tubing — ASTM A500, Grade B Steel

2. Welding shall conform to AWS code for arc welding in building construction.

3. No drifting of bolts nor enlargement of holes will be allowed to correct misalignment. Mismatched holes shall be corrected with new material.

4. Locate grease fittings for convenient access.

5. Each gate is to be assembled to the specifications below.

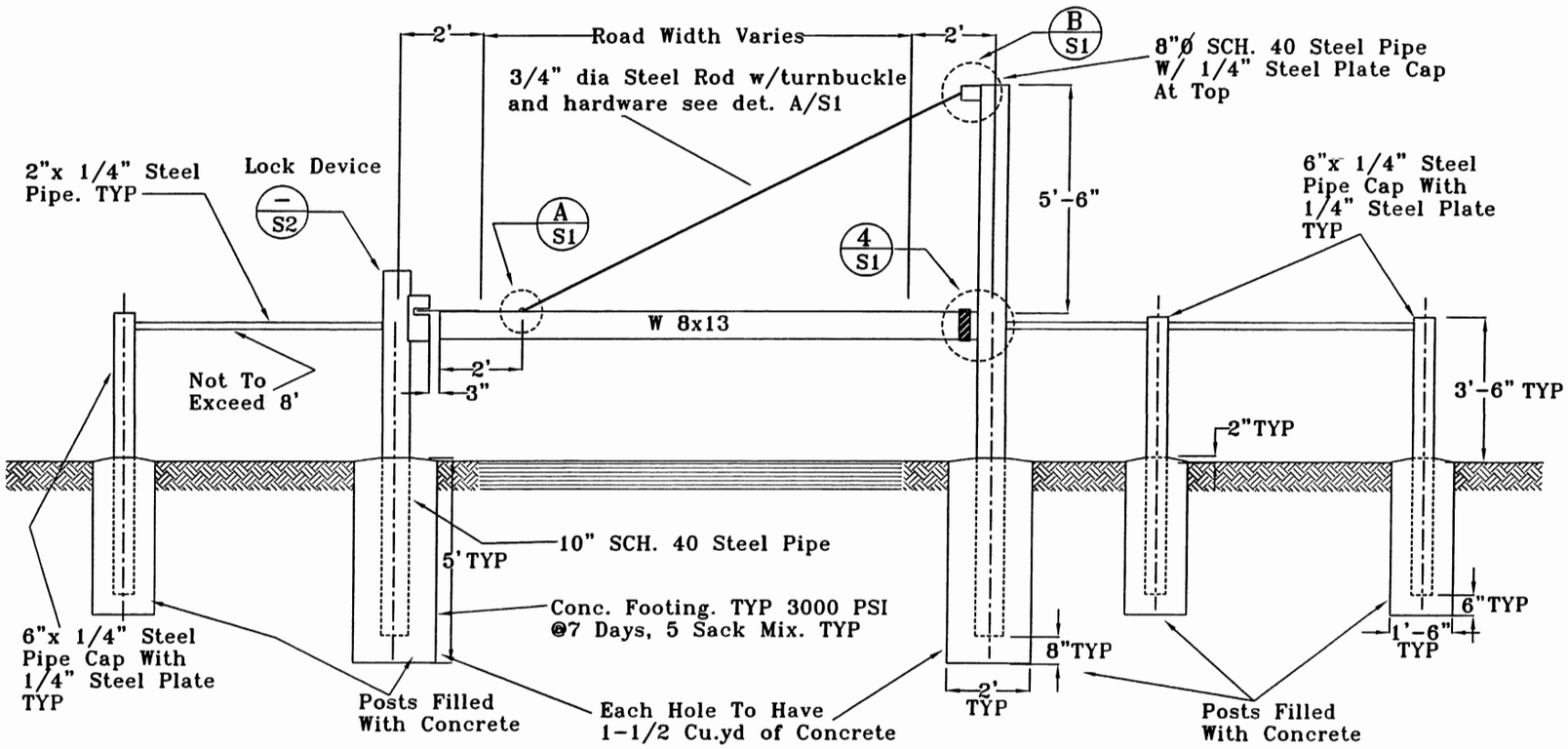
   A. Cut the vertical pipes to length & cap, and provide opening(s) to fit 3" SCH. 40 horizontal members as shown on DWG. S1, Front Elevation.

   B. Fabricate, assemble and attach assemblies shown in detail (B/S1) and in section (4/S1) to the 8"dia SCH. 40 pipe as shown on DWG. S1, Front Elevation.

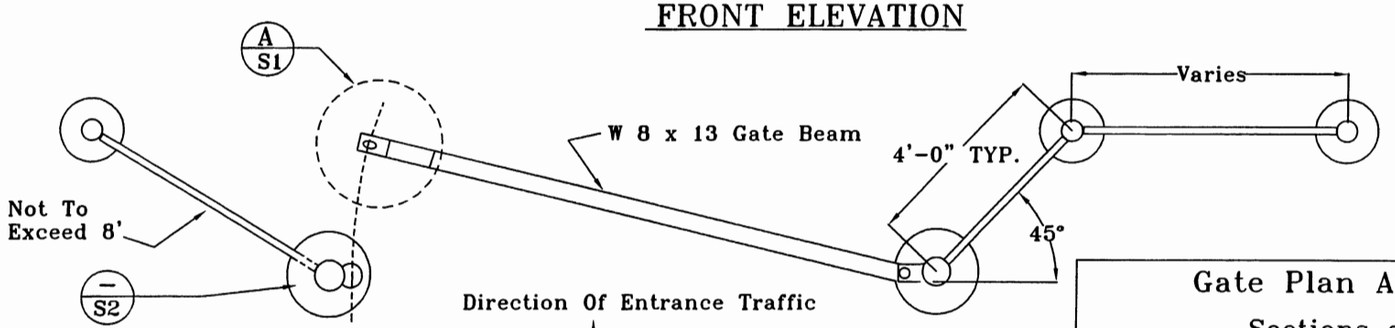
   C. Fabricate "T" and pin locking device to allow 2 locks to be locked independently of each other.

   D. Clean all surfaces of greases and oils before applying primer.

6. All materials shown on DWG. (S1 & S2) is to be supplied.



FRONT ELEVATION



PLAN

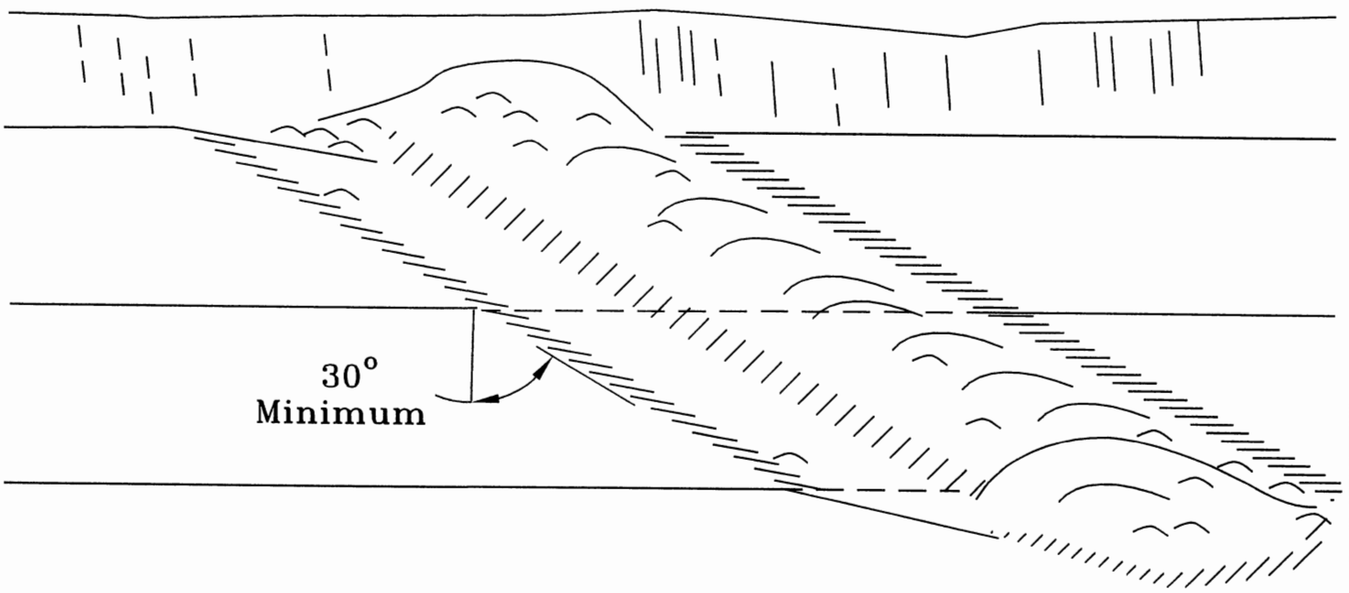
Gate Plan And Elevations
Sections and Details

Date: 7/28/2004
Scale: None
Page : 1 of 2
Edited By: W.H.

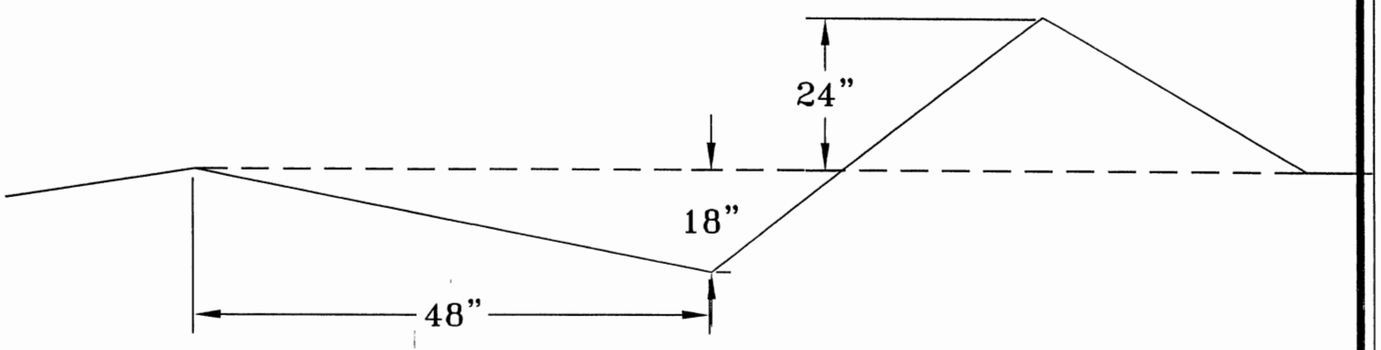
WASHINGTON STATE DEPARTMENT OF
Natural Resources
SPS Region

Non-Drivable Water Bar Detail

Cross Ditch



Cross Section at Centerline



The Big Kahuna Timber Sale
Water Bar Detail

Date: 7/28/04
Scale : None
Contract #30-076006
Drawn by: M.A.D.

WASHINGTON STATE DEPARTMENT OF
Natural Resources
SPS Region

Legal Description: SE ¼ SW ¼ Section 2 Township 14 North Range 6 East, W.M.

Rock Pit Name: Zig Zag Pit

PIT DEVELOPMENT PLAN

1. Pile debris in clean, burnable piles as directed by the Contract Administrator.

2. A minimum stripping width of 20 feet must be maintained from all pit faces and at the termination of operations pit shall be left in said condition.

3. Pile all reject rock and overburden away from pit working area as shown on pit drawing. Oversize material shall not exceed 5% of the total mined for the sale. Oversize material is defined as rock fragments larger than 1.5 feet in any dimension.

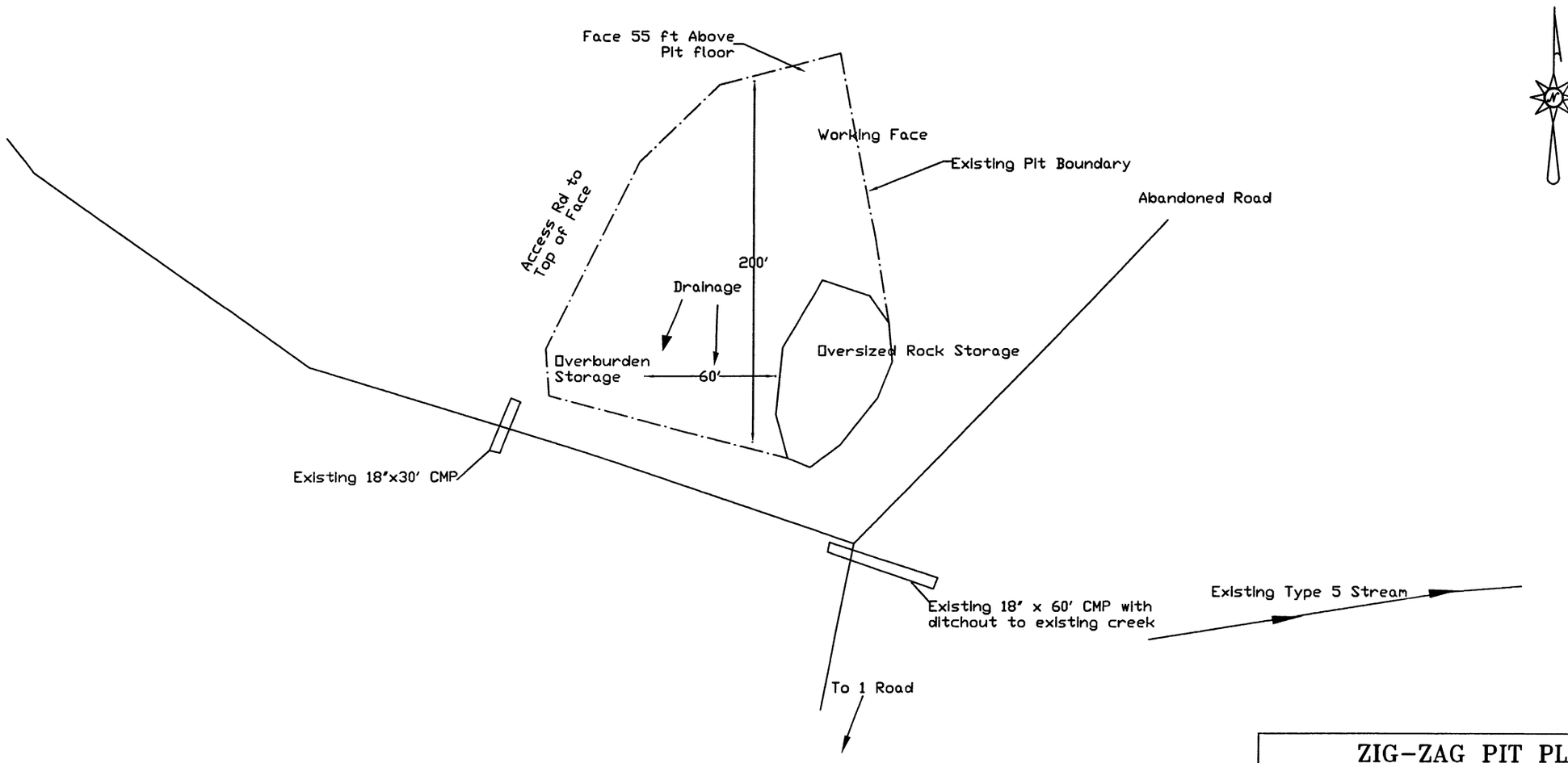
4. Pit floor shall be sloped to allow drainage as shown. No ponding will be allowed.

5. Maximum face height will be no greater than what can be reached by the excavating equipment.

6. At the termination of use the pit face shall have a maximum backslope of 1/2:1.

7. Quantity and Quality of ballast pit are not guaranteed by the State.

8. See "Zig Zag Pit" drawing for additional information.



Contract #30-076006
Date: 7/28/2004
Scale : None
Drawn By: M.D.B.

ZIG-ZAG PIT PLAN
The Big Kahuna Timber Sale

WASHINGTON STATE DEPARTMENT OF
Natural Resources
SPS Region

Legal Description: NW ¼ Section 6 Township 14 North Range 6 East, W.M.

Rock Pit Name: F-120 Pit

F-120 PIT DEVELOPMENT PLAN

1. Pile debris in clean, burnable piles as directed by the Contract Administrator.

2. Development of the pit shall proceed northerly and maintain existing pit floor elevation.

3. A minimum stripping width of 20 feet must be maintained from all pit faces and at the termination of operations pit shall be left in said condition.

4. Overburden shall be pushed to the designated overburden waste area and compacted in layers not to exceed two feet. Overburden waste area shall be seeded in accordance with the road plan clause 5.4-3.

5. Pile all reject rock and overburden away from pit working area as shown on pit drawing. Oversize material shall not exceed 5% of the total mined for the sale. Oversize material is defined as rock fragments larger than two feet in any dimension.

6. Maximum face height will be no greater than what can be reached by the excavating equipment.

7. At the termination of use the pit face shall have a maximum backslope of 1/2:1.

8. Working bench width shall be a minimum of 15 feet wide.

9. Quarry floor shall remain in a drained condition at all time. No ponding will be allowed.

10. At the end of operations faces and walls shall be scaled and cleared of loose and overhanging material.

11. Quantity and Quality of ballast pit are not guaranteed by the State.

12. All operations shall be carried out in compliance with all regulations of:
    A. "Regulations and Standards Applicable to Metal and Nonmetal Mining and Milling Operations" (30 CFR) U. S. Department of Labor, Mine Safety and Health Administration.
    B. "Safety Standards - Metal and Nonmetallic Mines, Quarries, Pits, and Crushing Operations" (296-61 WAC), Washington Department of Labor and Industries.
    C. "Safety Standards For Construction Work" (296-155 WAC), Washington Department of Labor and Industries.